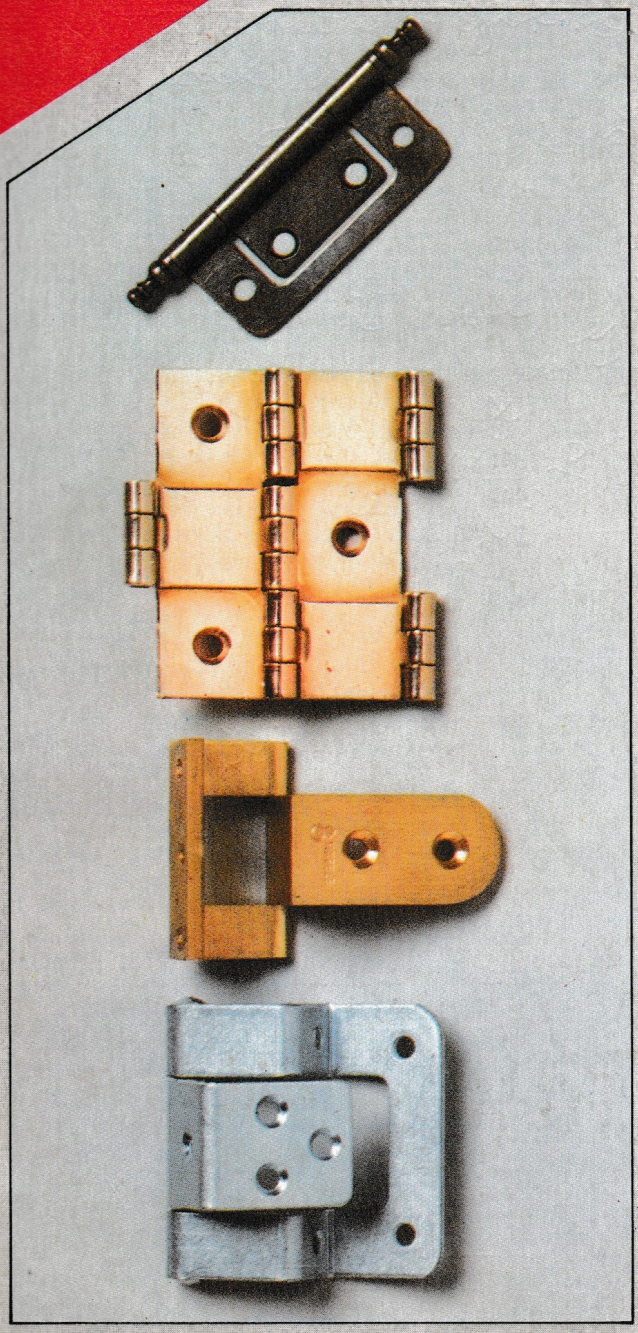
Autumn

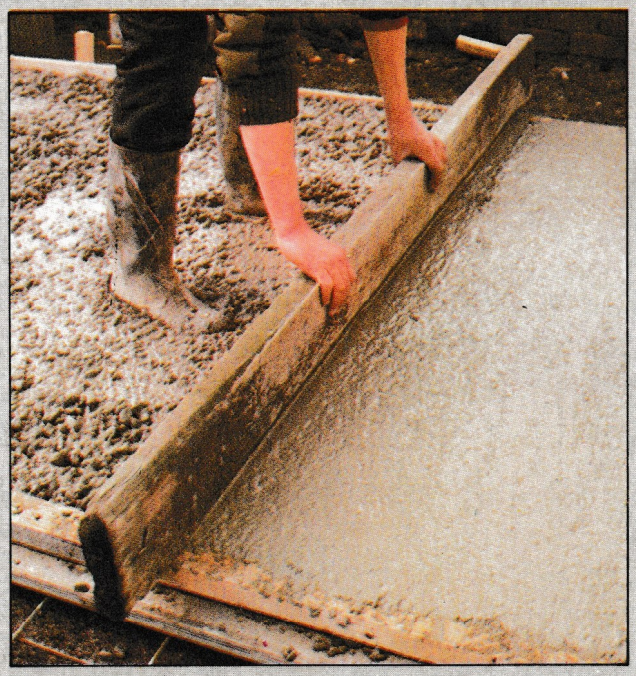
A Marshall Cavendish Publication in weekly parts

Part 10

THE KNACK

The complete manual of DIY skills, projects and home ideas





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THE KNACK

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The index

The last two parts of The Knack will form a complete fully cross-referenced index. For easy access to the information in your growing collection, interim indexes will be published to cover each 14-part volume. For quick reference, reminders on what has been covered so far in the volume will appear on the inside back cover.

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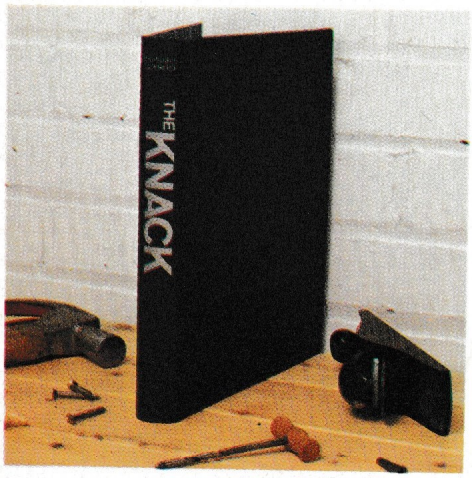

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Using plants

Using plants is one of the simplest and most effective ways of introducing life and colour into a room while at the same time adding new and creative ideas to enhance, disguise or simply add a touch of dramatism

Indoor plants are now so much part of interior decoration that it is hard to imagine life without them. Greenery flatters, softens and brings the garden indoors without bringing the attendant weather. A room with plants is instant attraction, without them it can seem incomplete.

First forays into a florist's shop or nursery can be daunting enough to put you off. All that luscious greenery with unpronounceable Latin names, exotica needing care and attention. Few sales people have the time, patience and understanding to explain what is what, and even then you have to know what you want. Too many people buy plants on impulse, price and eye-appeal and wonder why they wilt so fast when they get them home.

Plants are as important to a room as furnishings or accessories. Just as you would give an attractive piece of furniture or a painting a central position rather than tuck it away in a dark corner, use the same approach when choosing and siting plants.

Greenery can be used to create atmosphere—soft, dramatic, stylized or cluttered. Some plants look better with architectural severity, others cry out for rustic cottage cosiness. And plants speak volumes about their owner's life style.

So the choice of plants is two-fold. First, where you want to put them and the job they have to do, and secondly, the amount of heat, light and moisture that makes them happy.

Containers

The choice of containers is also important. It sounds elementary, but before going out to buy plants, measure the depth and diameter of available plant holders. The wrong container can ruin the look of a plant, the right one double its attractiveness. A rule to remember is that the actual casing of the plant should never show, so it must fit well inside the holder itself. If you are not sure, take the holder along to the shop with you.

As well as conventional flower pots, all sorts of other things can be used as plant containers. For example a brass coal bucket, earthenware baking dishes, a pewter tankard, acrylic

Right: *A single dramatic plant adds a touch of sophistication and has more effect on the room than many smaller displays*

Above: *A strategically placed mirror causing 'double-effect' reflections creates a feeling of space and added interest to a corner*

waste bins. For monster plants, giant sized containers come in cane and rattan, brass, ceramic, stone and acrylic plastic.

A plant and its container must look as though they belong together by being proportionate in size and shape. Draping plants need straight sides to contain them with the edges of the container softened by falls of leaves. Architectural plants need a base which is in balance with their height. Experiment with the same plant in an assortment of containers—it will look at ease in some, out of place in others.

Below: *A variety of plants and holders have been used to create an interesting and colourful display in a plain window area*

Positioning

Rooms dictate the size of plants. You will know if you have space for a large, exuberant floor plant, for it cannot help being dramatic.

Floor plants need plenty of space around them and a simple backdrop to show them to their best advantage. As foliage is often dense, avoid putting a giant plant too close to a wall or it will become a dominant mass. Some suggested areas are in an alcove or corner of a dining room; beside a stairwell; as a highlight on a raised plinth or seating area; on a recessed upper hall window-sill.

Another way to treat giant plants in a living area is to make one or two the focal point of a corner or window grouping. Create a pyramid shape with smaller plants arranged in front. Blend in a stone statue. Display nuts and fruit in a large flat bowl at floor level. If you have little furniture and a limited budget, plants are a marvellous distraction and also a creative way of filling empty space.

Large plants

There is a good selection of large plants in various styles—anything from the flamboyant to the very simple. But whatever you choose remember large plants tend to be committing. Once in place they domineer—especially when they start to top two metres in height—and they are also difficult to move around. But some of the following examples may be worth a consideration.

Kentia palm: This is probably the most fashionable—and expensive—floor plant. It has jungle-like fronds,

Above: *High-level shelving and a simple 'bamboo garden' theme have been cleverly combined here to create a truly exotic flavour.*

which can reach a height of 3m, and was once a hotel lobby favourite.

The kentia palm is popular because it is immensely graceful like a giant leafy umbrella. Also, it tolerates neglect, poor lights and fluctuations in temperature. A kentia will therefore thrive and survive in a darkish alcove or hallway, especially when moved occasionally to a sunnier position.

Swiss cheese plant: Despite its name, this plant is a native of Mexico with shield-shaped, deeply slashed, leathery leaves and a central trunk which needs supporting. It is quite adaptable and can cope with fluctuations of temperature and occasional low light, making it popular for interior decoration. The cheese plant grows to a monstrous height and its bushy foliage will give dramatic flair to a room.

Smaller plants

On the whole, smaller plants fulfil a different need and furnishings need to be taken into consideration as well as height and position in a room. There are literally hundreds of small plants to choose from.

First you must ask yourself whether you want your new plant to be an eye-stopper, part of a group, rigid and defined, or soft and gentle. Consider, too, the location and surrounding objects—whether the plant will blend in well with the table it is going on or with the surrounding pictures and wall ornaments.

The principle with any group of greenery is to keep it simple, limiting yourself to no more than two or three plant types. If you are using one container, arrange the plants according to height and make sure that the edges of the bowl or dish are well softened. Ivies, for example, look best draping in some way, as over the side of the mantelpiece, shelf, or hanging basket.

Flowing plants

Central to the group of smaller plants is the green, soft and flowing medium-sized range. These are the type that look good in baskets, draped over mantelpieces and generally tone in with the rest of the decor without jarring the eye.

Grape ivy: This is a well-known member of the ivy family, with 75mm leaves dark green in colour and sprawling grape-like tendrils. The grape ivy is a useful climbing plant for softening the edges of containers, arranging on a dining table or suspending from a ceiling basket. It is tolerant of average temperatures, light and humidity and will adapt to light of low intensity. An east-facing kitchen window sill which gives direct sunshine a few hours a day would be an ideal location.

Maidenhair fern: This is a fern that actually likes living in the shade—it curls up and dies if exposed to direct sunshine but needs plenty of moisture. With fragile, lettuce-green fronds on black wiry stems it tends to drape well. A group of maidenhair ferns would look good in a large bowl at floor level, perhaps in the shade of a kentia palm. Tuck them on to dressers, shelves or in poorly lit corners.

Below: *A simply contrived step arrangement makes an ideal setting for a colourful selection of small plants and climbers*

Spider plant: This is a fast-growing, prolific native of South Africa, and is hard to kill off. It has long, arching, green and white striped leaves and grows its own plantlets—the little outrunners which give the plant its name. The spider plant needs minimal care, only partial shading, and looks good draped over coffee tables, mantelpieces, in a hanging basket or anywhere high up. It is a winner if you have little experience of keeping plants or do not bother spending too much time on them.

Variegated plants

Variegated plants need to be carefully mixed in with the general theme of your decoration. Those with strong leaf colours tend to look better in a group of one variety with their leaves matching the colour scheme of the room. They also tend to stand out in a crowd, which you may not want.

The Begonia Rex family: There are many varieties of these. The leaves have silver, cream, pink, red, purple and copper markings—an obvious choice if you want to brighten the aspect of a dull room. They do not like direct sunlight and look best in a group arrangement.

Plants for colour

If you are simply looking for splashes of colour to give boost or flair to the house, there is plenty of choice. Many of the colourful plants are seasonal and have been specially forced in a commercial greenhouse, giving them a limited spell of life. Enjoy them in their prime and when they have done their turn in the house, plant them in the garden. The best known winter varieties are azalea, cyclamen, poinsettia, hydrangea and orange tree. Plants with year-round colour include the African violet family. This is universally popular and easy to grow; new, robust breeds come in many colours. The dark green, velvety leaves grow right over the pot making it particularly striking. It needs plenty of light and constant moisture, but not direct sunlight which may cause the leaves to wilt.

One of the best indoor survivors, despite what you do with it, is the humble geranium. Kept on a window sill it will flower out of season and look just as good as green foliage.

Finally, do not forget the busy Lizzie which produces a profusion of red, pink or white flowers throughout the year. It grows into a bush-like shape up to 600mm, and has pale green pointed leaves. Busy lizzies like direct light in winter, shade in summer.

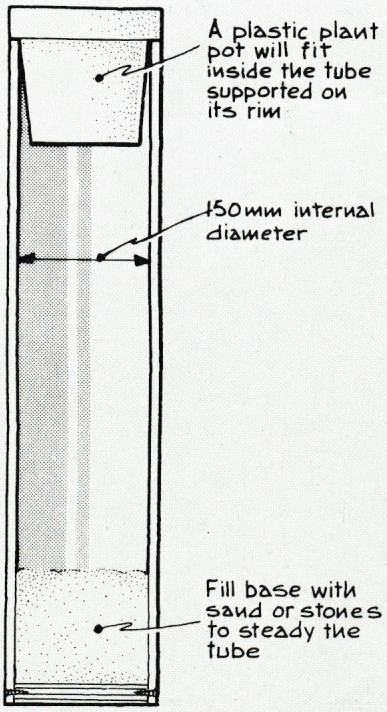
Make a corner planter

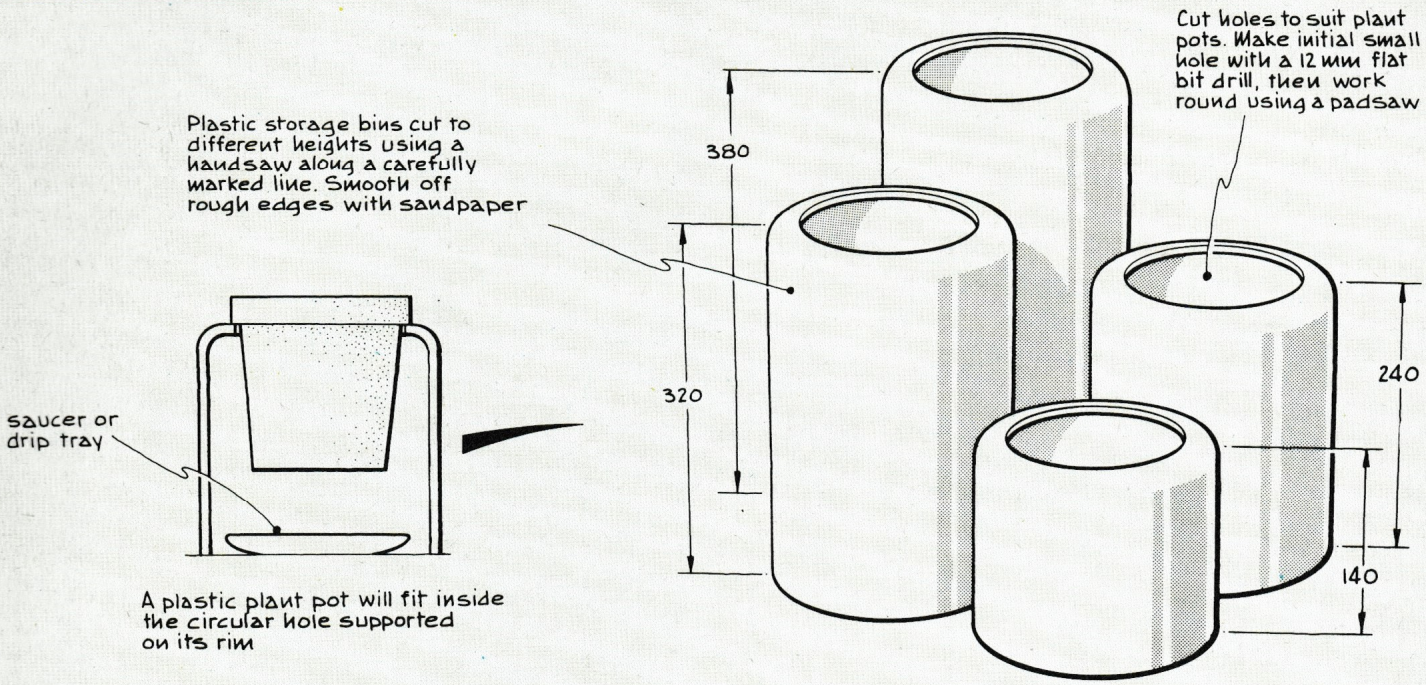
Ray Duns

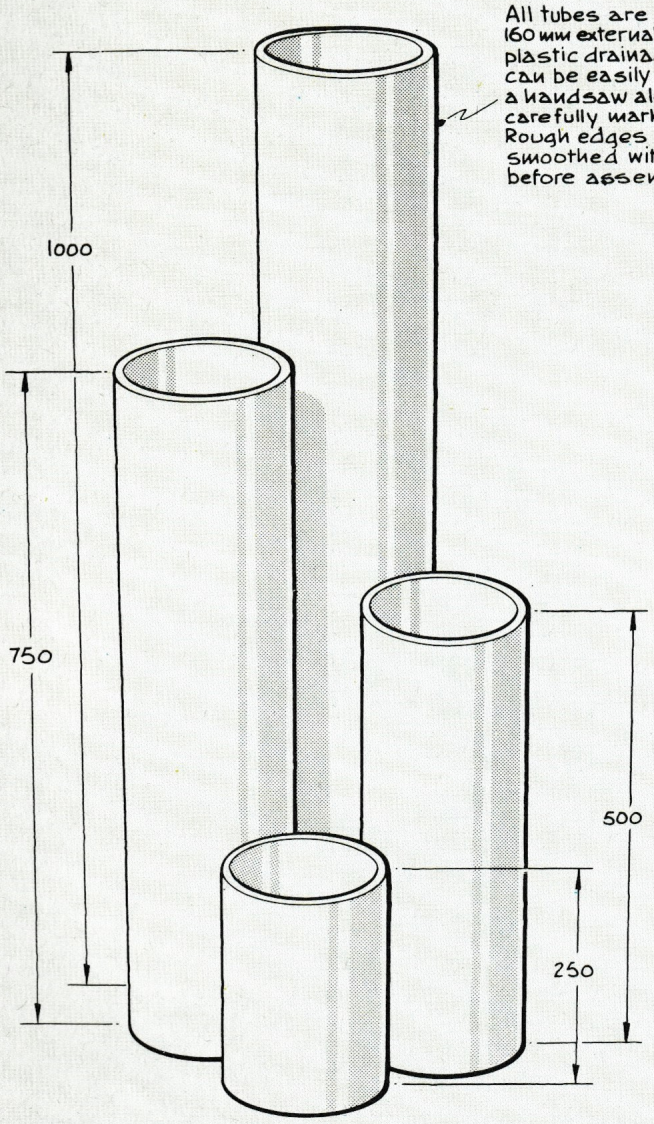
Indoor plants can be a very effective way of adding interest to an unused corner of a room—especially if they are grouped in an attractive planter.

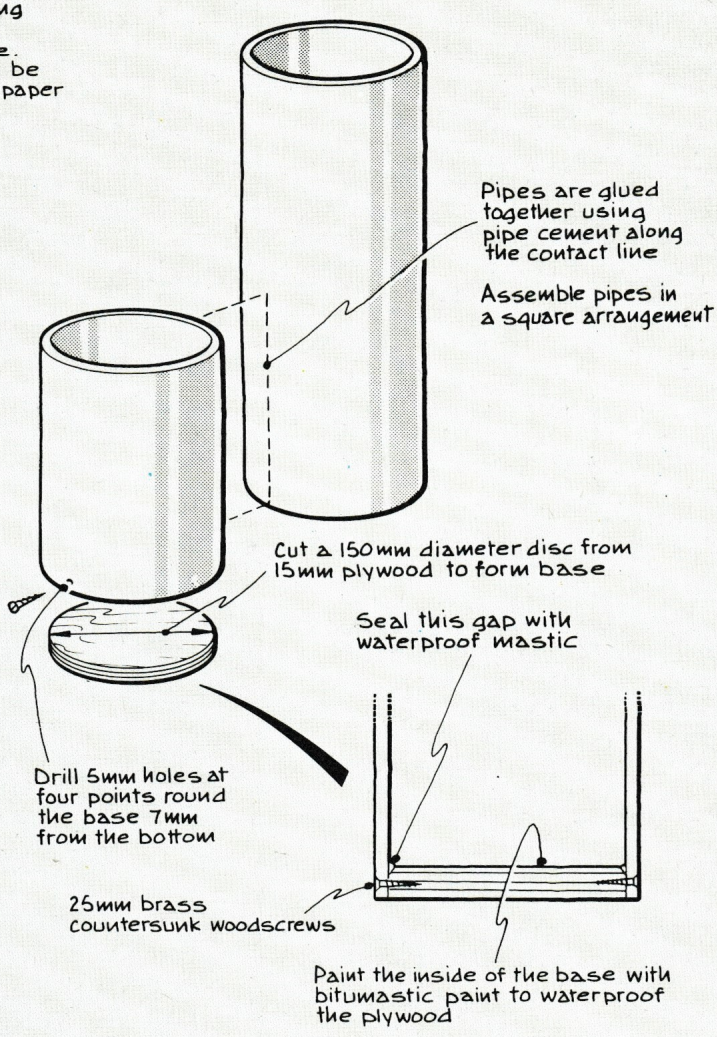
These designs are simple to make, and provide space for a large number and variety of plants. The planter shown above is made from upturned plastic storage bins cut to different heights as shown in the drawing opposite. Cut holes in the bottom to accept the rims of plastic plant pots. The pots need no fixing, so you can easily remove them if you want to change a plant. The rims can be hidden with trailing or spreading plants. You should water sparingly, but a drip tray placed underneath will prevent damage to floor coverings. The bins can be painted with plastic enamel or left in the natural colour.

Also shown in the diagrams is an idea for a tall planter made from plastic drainage tube. Once again, the plants are in removable pots.


A plastic plant pot will fit inside the tube supported on its rim
150mm internal diameter
Fill base with sand or stones to steady the tube

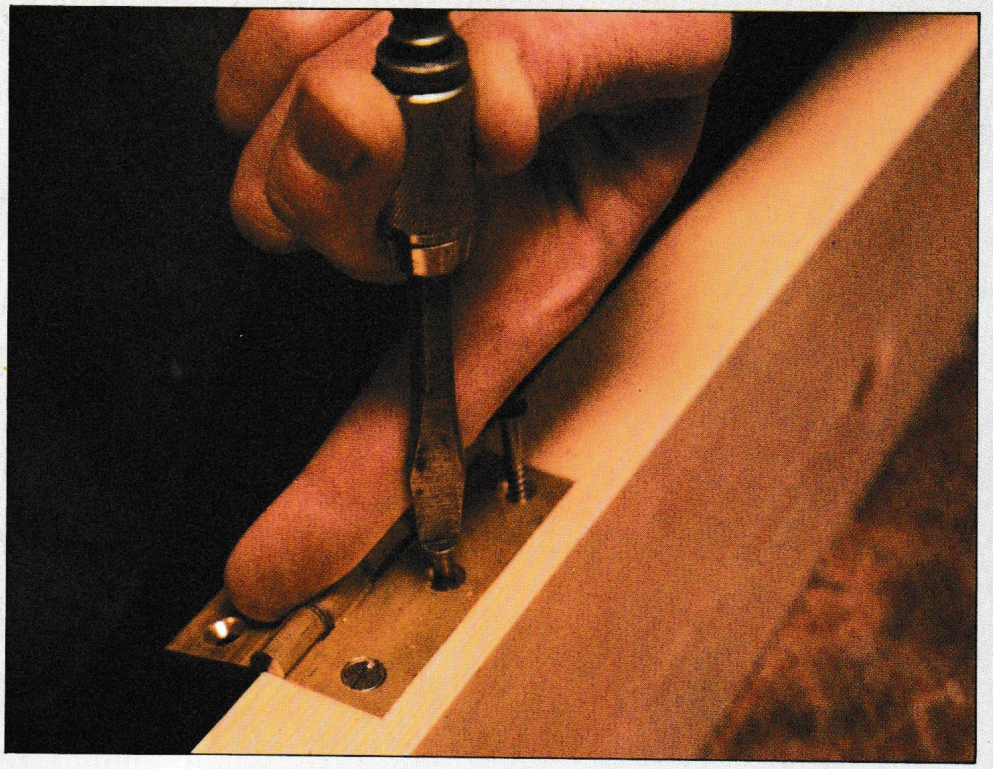

Plastic storage bins cut to different heights using a handsaw along a carefully marked line. Smooth off rough edges with sandpaper
saucer or drip tray
A plastic plant pot will fit inside the circular hole supported on its rim
Cut holes to suit plant pots. Make initial small hole with a 12 mm flat bit drill, then work round using a padsaw
380
320
240
140


All tubes are cut from 160 mm external diameter plastic drainage pipe. This can be easily cut using a handsaw along a carefully marked line. Rough edges should be smoothed with sandpaper before assembly
1000
750
500
250


Pipes are glued together using pipe cement along the contact line
Assemble pipes in a square arrangement
Cut a 150 mm diameter disc from 15mm plywood to form base
Seal this gap with waterproof mastic
Drill 5mm holes at four points round the base 7mm from the bottom
25mm brass countersunk woodscrews
Paint the inside of the base with bitumastic paint to waterproof the plywood

All about hinges

The way a door moves is dictated by the type of hinges fitted to it. So it is important to know how different types of hinge will cause doors to behave, before you fix them



Ray Duns

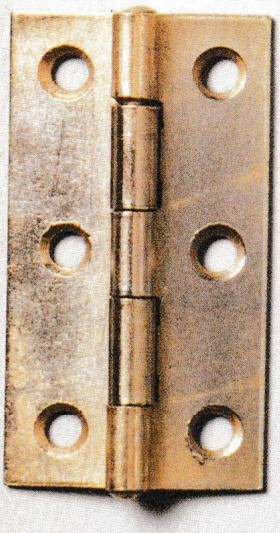
Hinges not only enable a door to move, they also support the whole weight of the door when it is open. Simple hinges for cabinet doors, adjustable screens, and the drop-flaps of desks and tables are usually made of steel or brass, but there are many other varieties of hinge for more specialized applications.

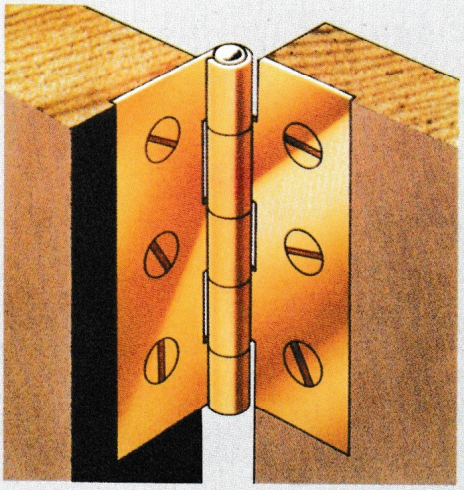
Different types of hinge cause doors to open and close in different ways, so always decide how you want a door to move before selecting its hinges.

The majority of hinges can be fitted to a door regardless of whether the door opens on the right- or left-hand side. But with certain 'handed' hinges, you must state whether you want left-handed or right-handed hinges when you buy them.

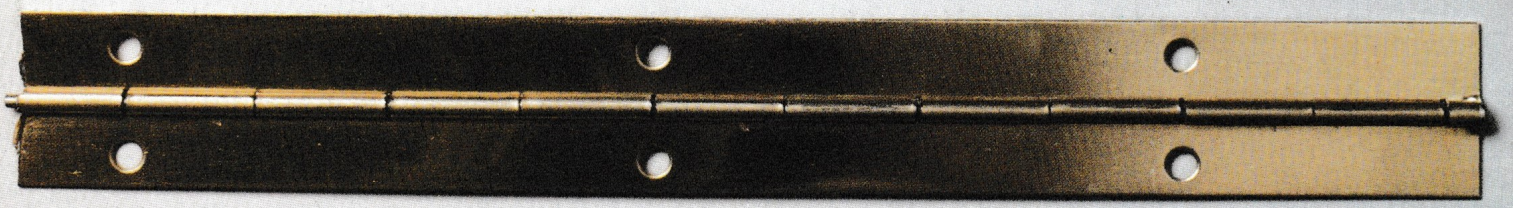
There are three basic methods of fitting hinges, the most common of which is recessing. This involves cutting shallow housings in the wood so that the flaps of the hinge are flush with the surrounding wood.

Certain hinges have fixing bases rather than flaps. Fitting these involves drilling a hole, or cutting a recess with a mortise chisel, to the shape and depth of the base. However, the simplest hinges to fit are those that screw directly to the surface of both the door and the frame.

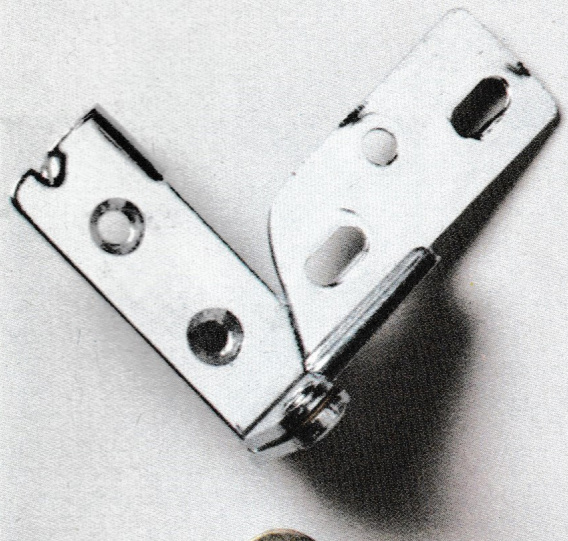




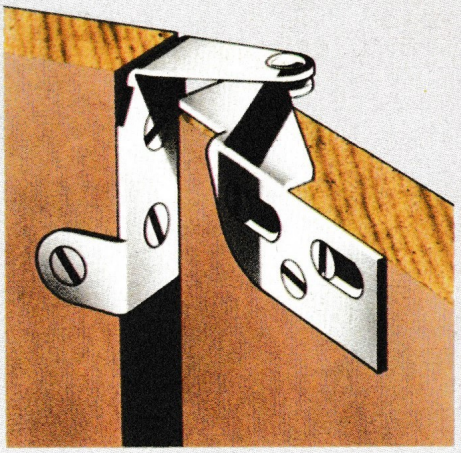
Left: *The butt hinge is the most common type of hinge used in cabinet and furniture construction. One flap—or leaf—of the hinge is screwed into a recess cut in the side of the door, while the other is recessed in the side of the frame. The pivoting section of the hinge, called the knuckle, projects just beyond the face of the door and frame, and when the door is closed, the two leaves are folded together.*
Below: *The piano hinge is a longer version of the butt and is used to hinge cabinet and chest lids. It is supplied in standard lengths and cut to the exact length required*

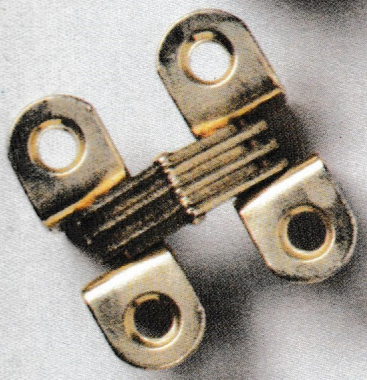


Peter Dazeley

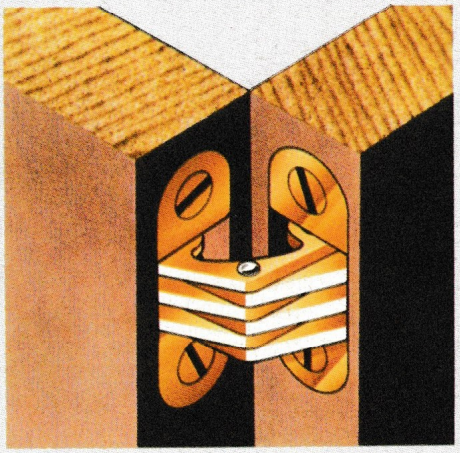


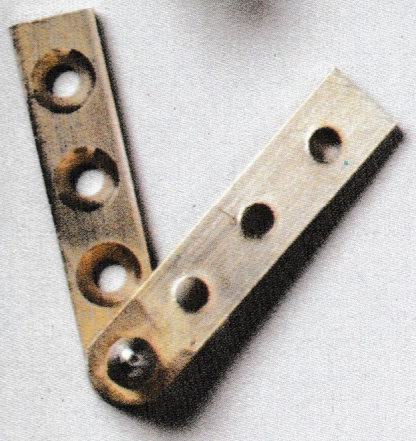
Lay-on pivot hinge: *This is designed for use on doors that fit onto the surface of the cabinet frame rather than those that are flush within the cabinet or set back slightly in the frame. The hinges are screwed directly to the top and bottom edges of the door, requiring no recesses to be cut, and have an opening angle of 180°. As the hinge at the bottom of the door is the reverse 'hand' of the top one, they are supplied in pairs of one right-handed and one left-handed hinge. Some pivot hinges allow the door to stay open in any position*



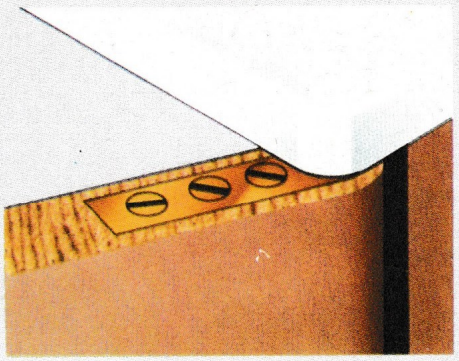


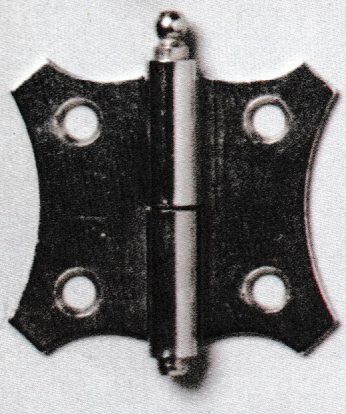
Mortise hinge: *Because the body of the hinge is completely concealed when the door or flap to which it is fitted is closed, the mortise hinge is often referred to as an 'invisible' hinge. The two sides of the hinge are housed in mortises cut into the side of the door and frame, and the pivoting action arises from steel prongs which run between the two pieces. Mortise hinges are used on flush and lay-on doors and, as they have an opening angle of 180° and no projecting knuckle piece, they are also ideal for concertina-type doors*



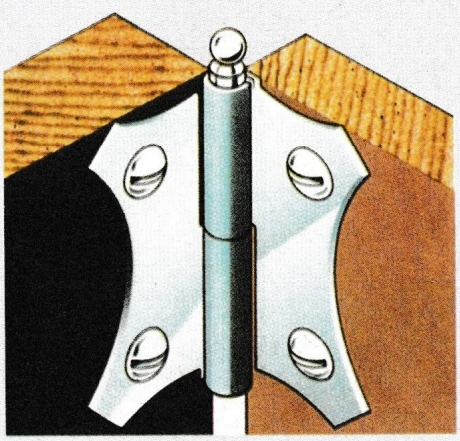


Centre hinge: *Sometimes, due to some special feature of the work it is impractical, or impossible, to fit hinges at the butt edge of the door. Centre hinges are recessed into the top and bottom edges of the door and frame, and move the pivot point away from the edge. The hinges are supplied in pairs and, to prevent the door from sticking, the hinge for fitting to the bottom of the door is usually fitted with a nylon washer*





Face-fixing hinge: *This type of hinge requires no recessing as it is screwed directly to the surface of the workpiece. It can be screwed to the interior of a cabinet, or to the exterior, giving a decorative appearance to the finished furniture. The example shown here is a lift-off hinge in which the leaves can be separated. The pin on which the leaves pivot is joined to one of the leaves and the other leaf fits onto it. The pin leaf is attached to the frame, with the pin pointing upwards, so the door can be lifted on and off*



Nigel Osborne

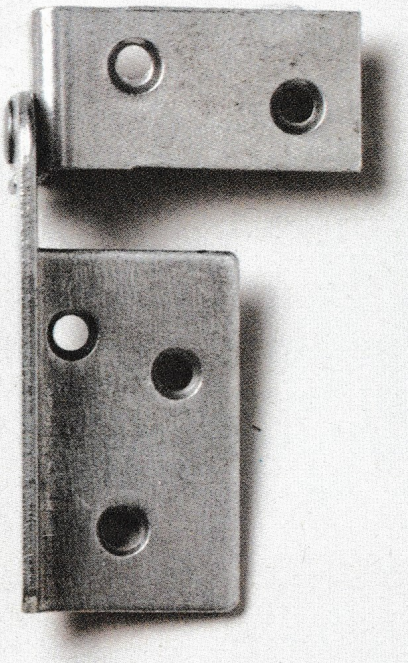
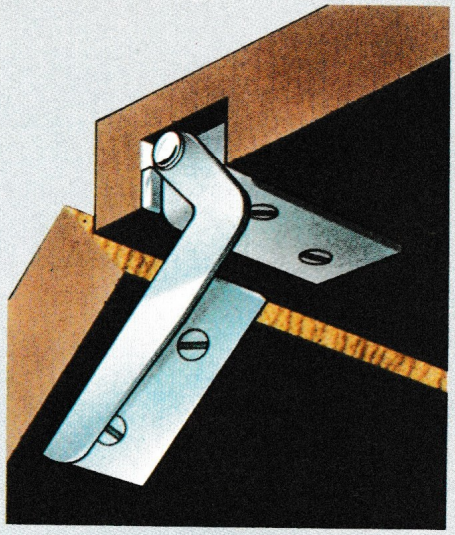
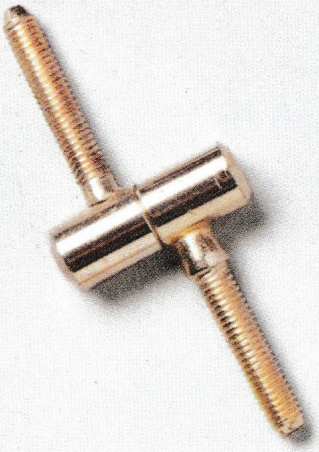
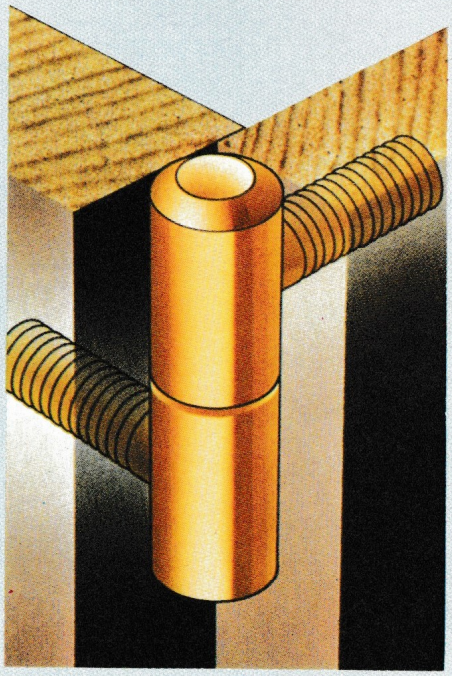


Table-flap hinge: *Designed for fitting to tables with a drop-flap, the table-flap hinge is unique in that it provides a flush joint in both the raised and lowered position. The pivoting section of the hinge is housed in a recess cut into the outside edge of the table and the leaf attached to it is fixed into place beneath. The longer, projecting leaf is screwed to the underside of the flap. When in the raised position, the flap of the table is supported by a stay of some kind—often a leg of the table itself—which slides outwards into position. Table-flap hinges are supplied in pairs, of one right-handed and one left-handed hinge*





Screw-in pivot hinge: *This brass plated hinge is widely used on lay-on doors of self-assembly chipboard cupboards and kitchen units. The arms of the hinge are screwed into prepared holes in the side of the door and frame, leaving the pivot pieces of the hinge visible. This hinge is of the lift-off type, enabling a door to be removed easily for cleaning or painting purposes. However, the main drawback with this type of hinge is that it is difficult to fit accurately as the screw holes drilled into the door and frame are not level with one another. In addition, the hinge has to be screwed into place by hand—if you hold the pivot pieces with pliers, to gain extra force, you risk breaking off the protective brass plating. If fitting this type of hinge, it is advisable to first plug the screw holes with chipboard fasteners*



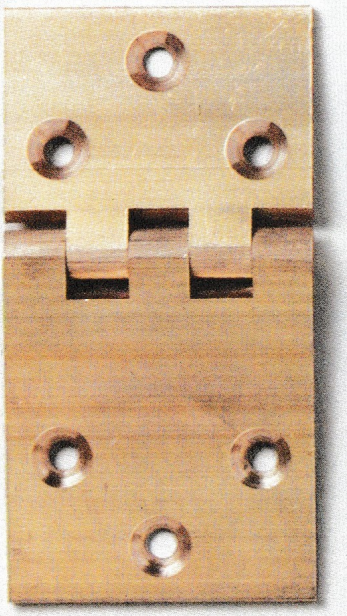
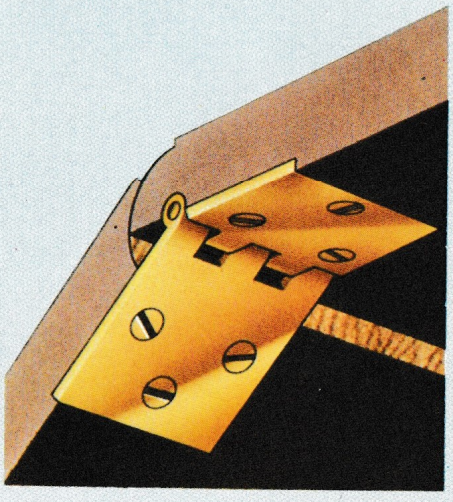
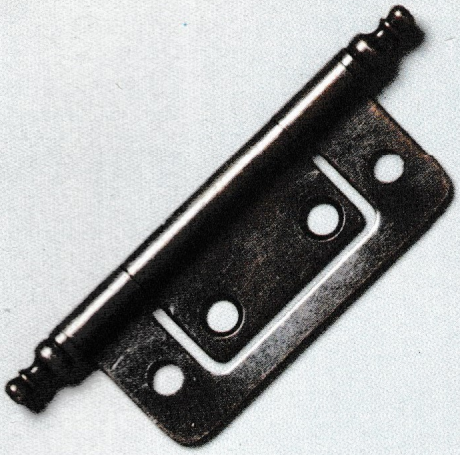


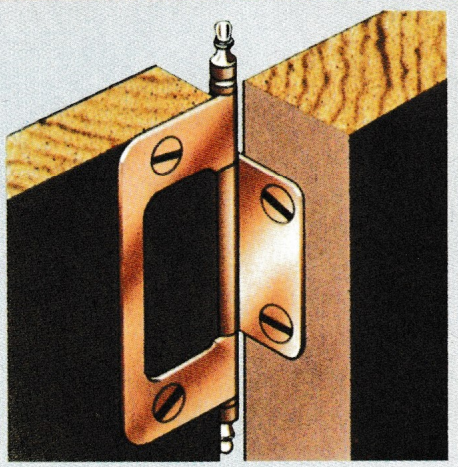
Table hinge: *A traditional flap hinge, usually made of brass, the table hinge is specifically designed for fitting to bureau and table drop-down flaps that have a rule joint. One of the leaves has to be approximately twice the length of the other to allow it to bridge the hollow section of the joint. This longer leaf is screwed into a recess cut into the underside of the flap, while the shorter leaf is housed in the adjacent workpiece. The knuckle of the hinge is recessed into the workpiece as well so that the hinge is flush with the wood. Thus, the screw holes are on the opposite side to those on a normal butt hinge*

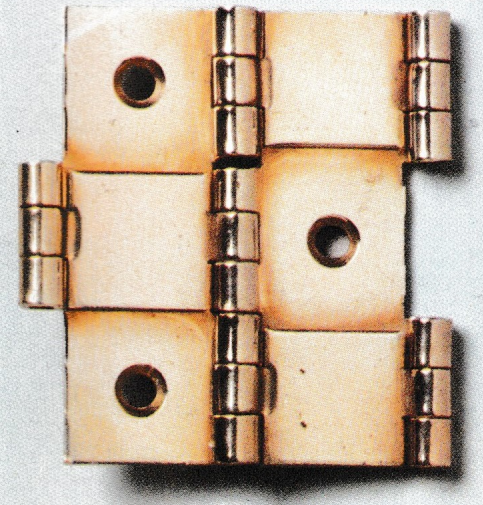


Peter Dazeley

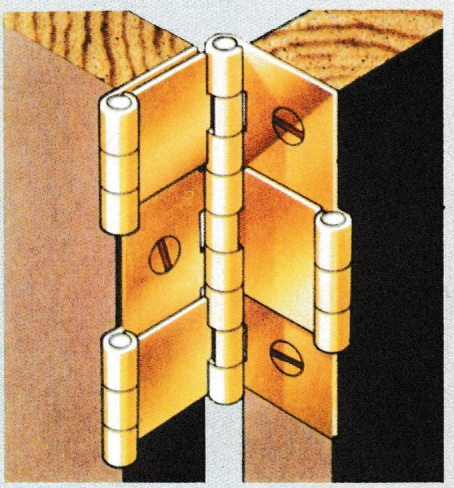


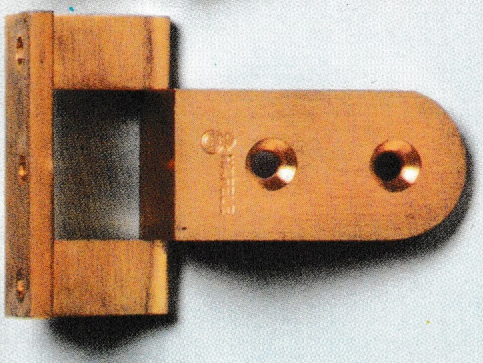
Flush hinge: *This serves the same purpose as a butt hinge but, being weaker, its use is restricted to screens and light foldaway doors. The hinge is screwed directly to the surface of the door and frame edge, requiring no recesses to be cut. When closed, the smaller leaf sits flush inside the larger, outer leaf. The outer leaf is usually attached to the frame and the smaller, inner leaf to the door. Decorative flush hinges, such as the example shown here, are available in a wide range of patterns and are frequently used in cabinet making, to give the work an attractive look*



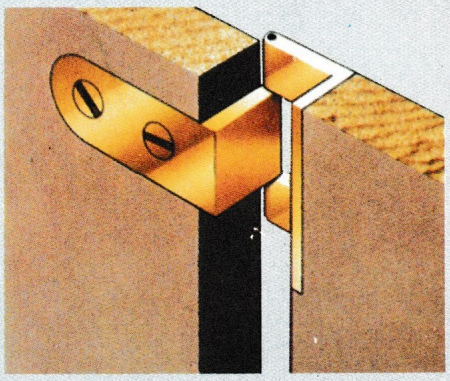


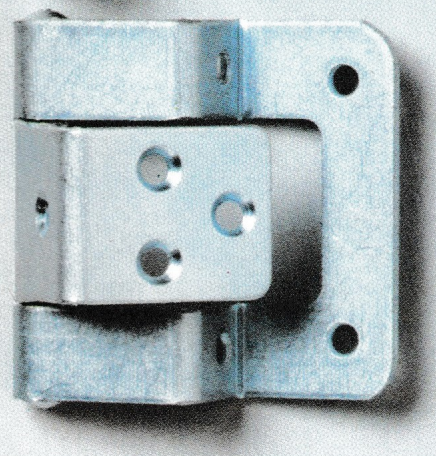
Paravent screen hinge: *This type of hinge, sometimes called a reversible screen hinge, is fitted to folding doors and adjustable screens. The hinge consists of three sections, and pivots at either edge to allow the workpiece to move in both directions. It is recessed into the workpiece on either side and, as the hinge has knuckles at each edge, it is essential that the distance between the pins is exactly equal to the thickness of the wood. If less, the folds of the hinge and screen will bind; if more, there will be a gap between the screen sections*



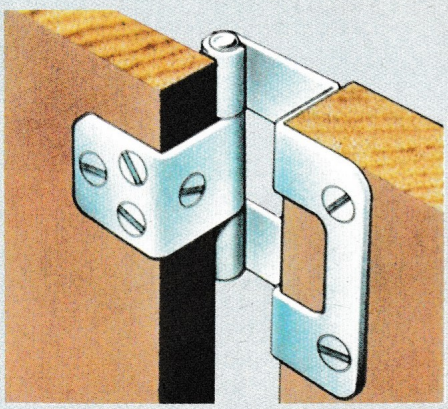


Double cranked hinge: *On a wardrobe that contains drawers, it is often necessary for the door to have extra opening clearance to prevent the drawers from coming into contact with it as they are opened. A double cranked hinge is often used in such situations. The outer leaf of the hinge, which is cranked into two right angles, can be fixed to either the frame or the door. Both frame and door are given extra support with this arrangement*

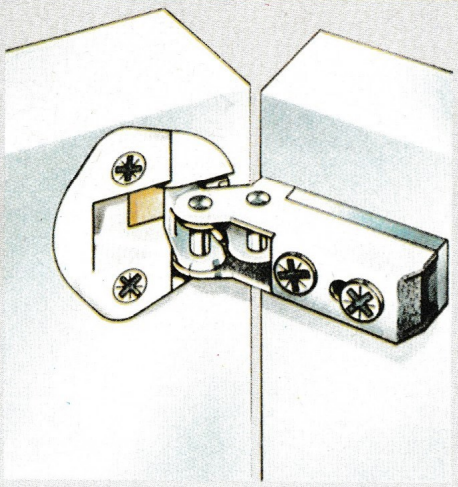




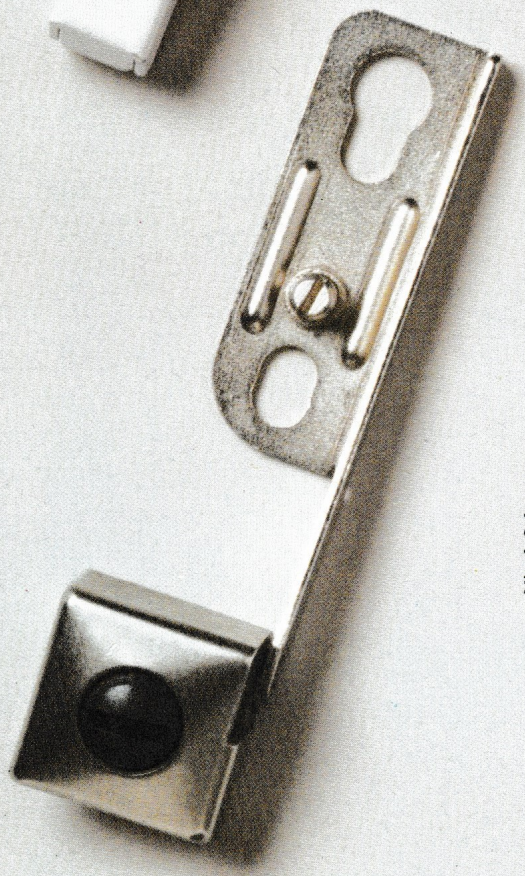
Angled cabinet hinge: *On some hinges, the leaves are cranked at right angles. This has the effect of bringing the pivot point away from the face of the door or frame, allowing a door a wide angle of opening. This type of angled cabinet hinge is mainly used for hanging the doors of cabinets of antique design or modern cabinets finished in wood veneer. The longer leaf is recessed into the face of the door on one side of its angle while the other lies on the door edge*

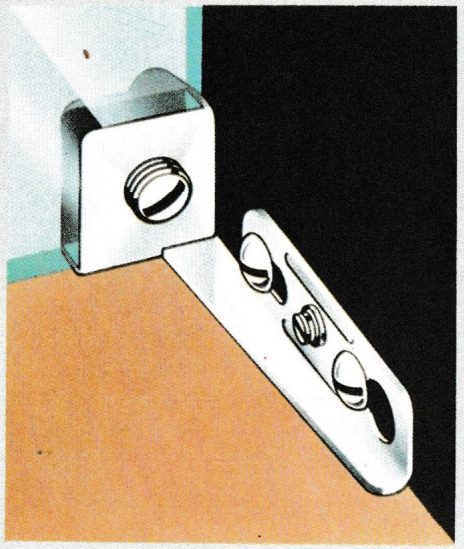


Nigel Osborne



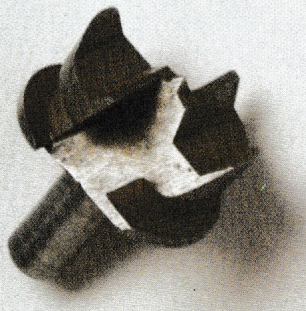
Concealed cabinet hinge: *Often fitted on modern kitchen units, the boss of the hinge fits into a milled housing on the back of the door*

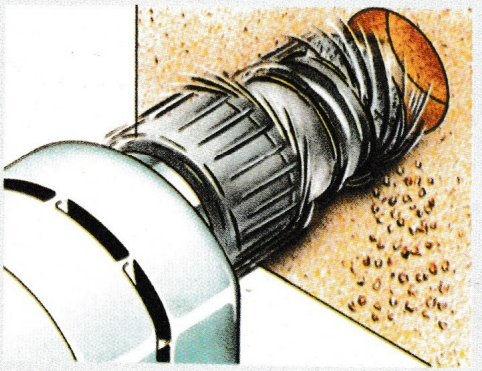




Nigel Osborne

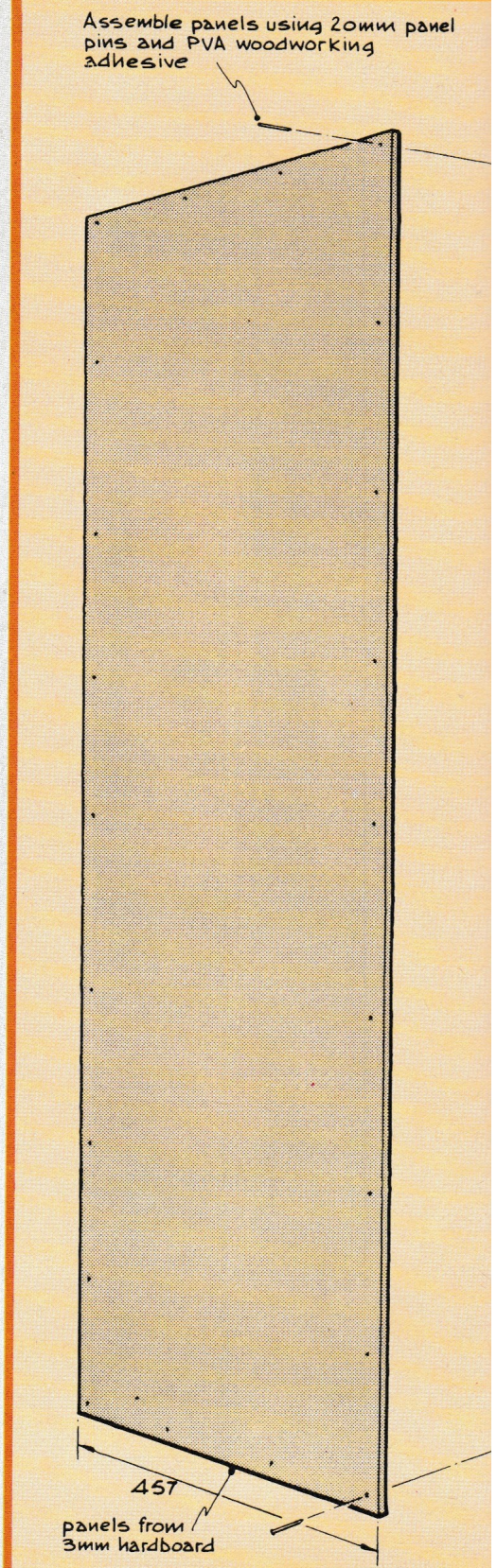
Glass door hinge: *For use on the door of a bathroom cabinet, the hinge arm is fixed to the frame and the glass secured in the body*





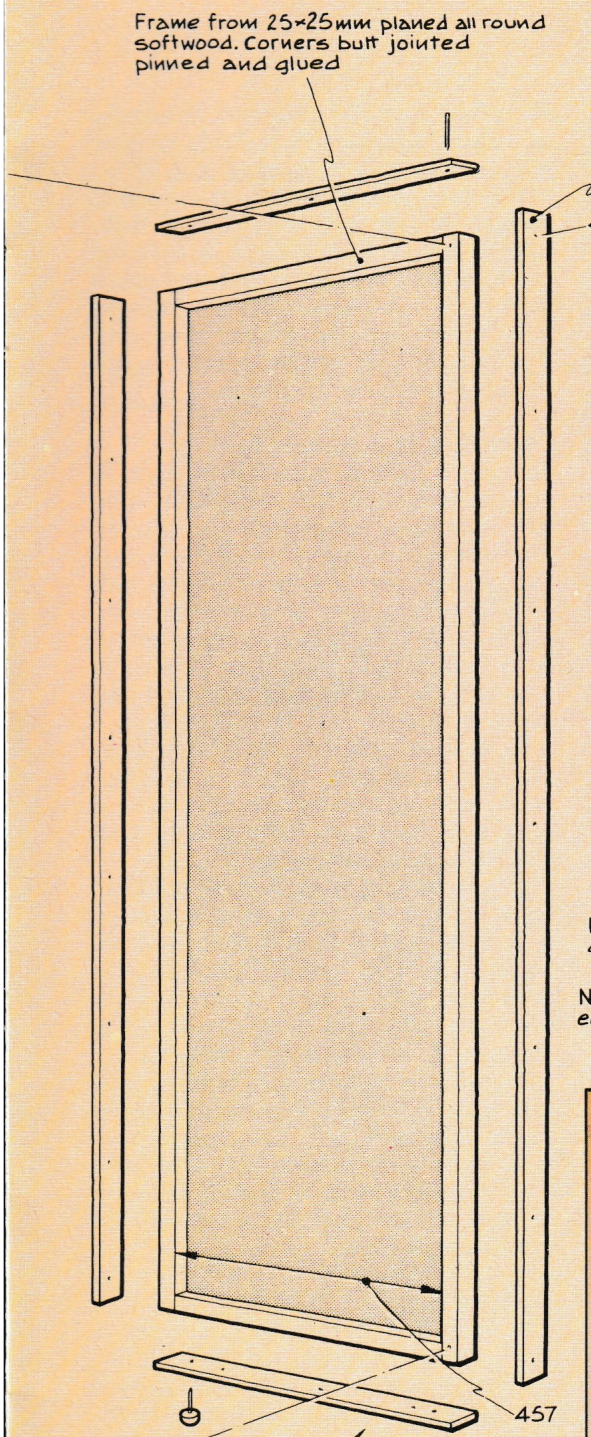
End mill: *This drill attachment is designed for boring out the housing in the door of a cabinet, to accept the boss of a concealed hinge*

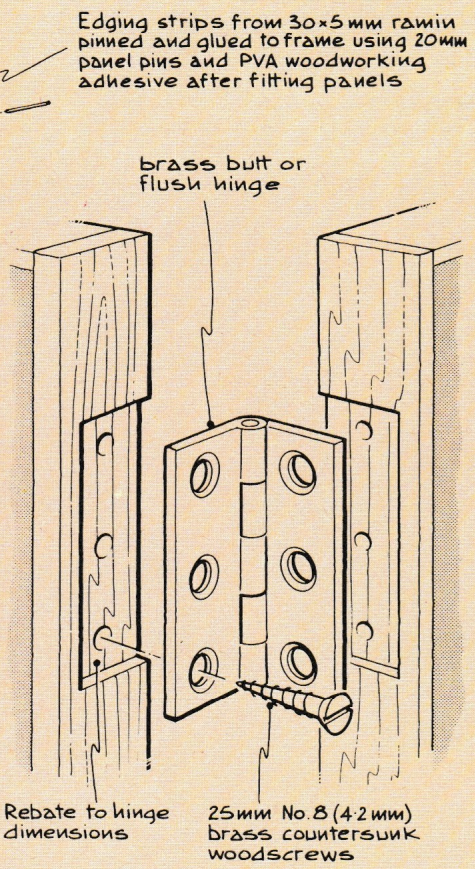
Peter Dazeley



Heights of panels are stepped:
1 No 1800 mm
2 No 1700 mm
2 No 1600 mm

Elegant divider screen


Frame from 25×25mm planed all round softwood. Corners butt jointed pinned and glued
457
rubber headed nails
ramin edging glued and sanded flush with hardboard surface


Edging strips from 30×5mm ramin pinned and glued to frame using 20mm panel pins and PVA woodworking adhesive after fitting panels
brass butt or flush hinge
Rebate to hinge dimensions
25mm No.8 (4·2mm) brass countersunk woodscrews

N.B. As panels concertina, hinges on opposite edges are on opposite sides of the panel

A divider screen is a useful addition to any home. It can be used to screen off a studying youngster from the distractions of the television in a living room. Strong sunlight streaming through a large french window can be irritating at times—a strategically placed screen will lessen the glare. The screen can be used to divide up a long room, to wall off an alcove, to block off draughts, or simply as a decorative feature.

Add interest to your screen by transforming it into a mobile mural with picture postcards or your children's drawings. Or paint each panel in a contrasting colour to add a touch of glamour.

This simple-to-build divider screen is very light and therefore easily moved from room to room. The panels can be folded completely flat against one another, so the screen can be stored away in a cupboard when not in use. When erecting your screen, remember not to fold out the panels so that they are level with each other, or the screen will fall over.

You can vary the height of each, individual panel, if desired, to make the design of your screen completely original.

David Jordan

Advertising Arts

Laying raft foundations

● Planning and setting out the project ● Preparing the site ● Constructing the formwork ● Laying mesh for loadbearing foundations ● Tamping the sections of concrete

Ray Duns

Raft foundations are the large slabs of concrete on which rest garden sheds, greenhouses and outhouses. Their function is to spread the load of the structure above, together with its contents, over a wide area.

Laying a stretch of concrete—for a patio, path or driveway—is a good introduction to the concreting techniques used in making rafts. It also leaves some margin for error if you have never worked with concrete.

Above: *The final section of a large raft foundation is filled and tamped after the concrete in the adjacent bays has been laid and set*

Planning the project

Make a scale drawing of your proposed project before you start work. If you are planning a patio, path or driveway it will be much easier to run this right up to one wall of the house. Multiplying the final area of the project by the required thickness of concrete gives you a guide to how much concrete you need. For a drive, aim for a minimum thickness of about 100mm concrete over 100mm well-tamped hardcore. This can be reduced to 75mm concrete for paths and small patios or a minimum 50mm concrete over 75mm well-tamped hardcore. But if your soil is particularly soft, consult the local building inspector.

Ordering the concrete

For work of this kind use a mix of one part cement to two parts sand to four parts aggregate or gravel, plus enough water to bind the ingredients together. If your estimates call for more than $3m^3$ of concrete, consider having it delivered ready-mixed by a local concrete firm. The extra cost may be more than offset by the savings in time and effort.

Remember that if you are concreting in large 'bays', you need two loads of concrete delivered on separate occasions. Allow for the cost of this in your estimates.

When ordering ready-mixed concrete, bear in mind that the company's truck will need access to the site. Be sure both of the mix and quantity of concrete you want and if there is more than one firm in your area, shop around for a competitive quotation.

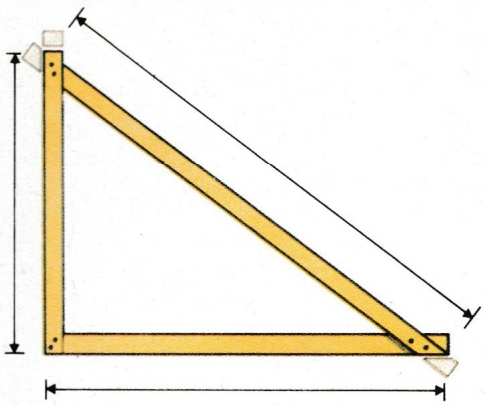
If you are mixing by hand, check with your builder's merchant on how much concrete the dry ingredients will make up. Remember that you need a level patch of ground as near to the site as possible on which to mix the concrete.

Setting out

You will find it helpful to choose a site which is more or less level: ground which is heavily sloping calls for more involved concreting techniques, covered further on in the masonry course.

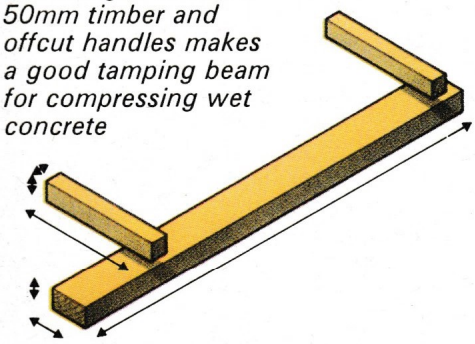
If you are working from an existing house wall, take this as your base setting-out line and take other measurements from it. If not, drive in two wooden pegs and stretch a length of masons' line or twine between them. Ensure that the pegs are well outside either side of the work area.

Your second setting-out line will run at right-angles to the baseline and mark one side of the project (fig. C). Having measured and marked where the line will cross the baseline



A. *Make a builder's square by nailing together offcuts of wood—vertical 300mm, horizontal 400mm and the diagonal 500mm*

B. *A length of 100 x 50mm timber and offcut handles makes a good tamping beam for compressing wet concrete*



(or wall), set it up with pegs and line. Use a builder's square (see above) to ensure that the angle between the two lines is exactly 90 degrees.

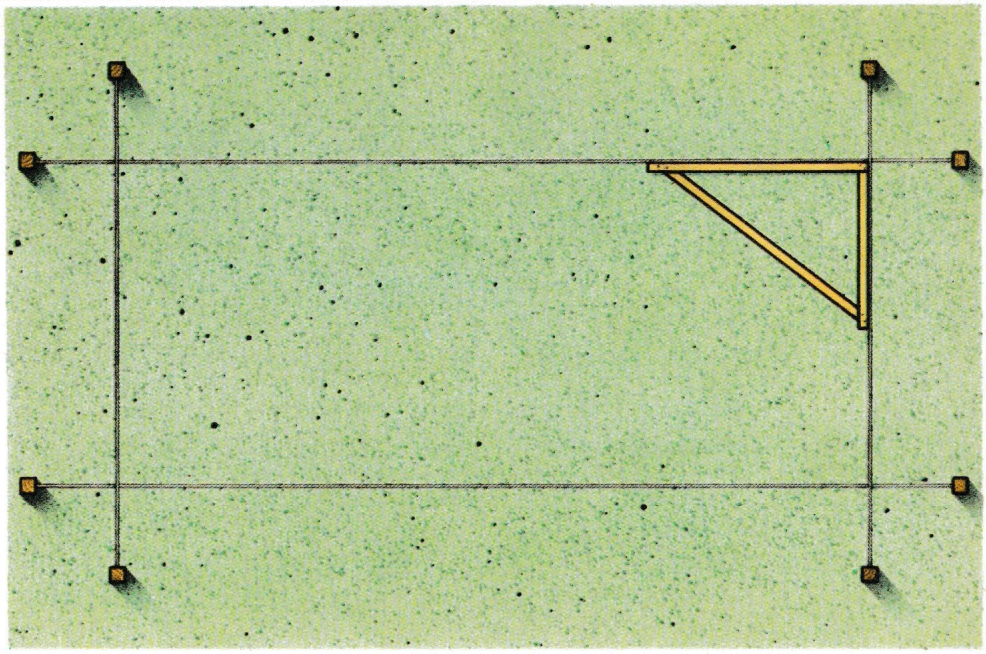
The third line—marking another side of the project—should run parallel to the baseline. Measure out from both sides to the baseline to ensure that this is so then set up the pegs and line. Again, use the builder's square to check that the corner with the second line is 90 degrees.

The fourth line—marking the final side of the project—runs parallel with the second. Measure and set it out in the same way as the others so that you have an arrangement similar to that shown in fig. C.

As a final check to ensure that the corners of the project will be square, measure across the diagonals. If the measurements are not exactly the same, adjust the positions of the pegs accordingly.

Preparing the site

Start by removing all obstructions and traces of vegetation—such as weeds and roots—from within the boundaries of the site. If there are some areas of existing concrete on-site, these must be broken up into rubble with a pick.



C. *Use the builder's square to ensure that the setting out lines are perfectly square*

To get the site level, you need a straight piece of timber 2-3m long and a supply of wooden pegs, about half as long again as your proposed depth of concrete.

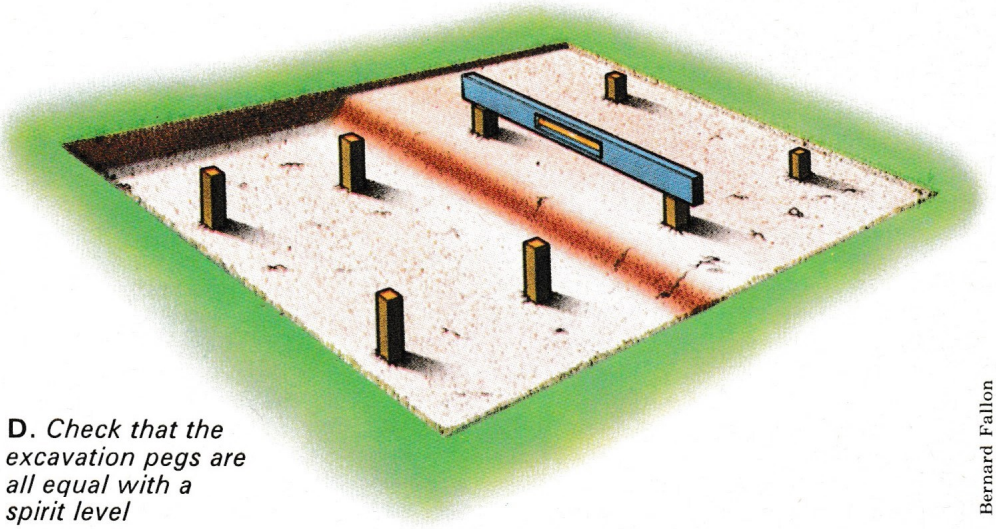
Decide where you want the final level of the concrete to be—normally against a lawn or floor of the house—then drive one of the pegs into the ground on the edge of the site. The top of the peg will mark the final level of the concrete and is known as the datum. Ensure that the finished level of the concrete is a minimum of 150mm below any adjacent damp proof course—also that the concrete slopes away from the house in about a 1:60 fall to deal with surface water.

Use the straight piece of timber and a spirit level to check the height of the peg against the point you are taking your level from.

The site can now be excavated to the required depth, working away from the datum peg. As you progress, more pegs must be driven in to help you keep an eye on both the level and depth of the site. The pegs should be no further than the length of your straight edge away from each other—or from the datum peg.

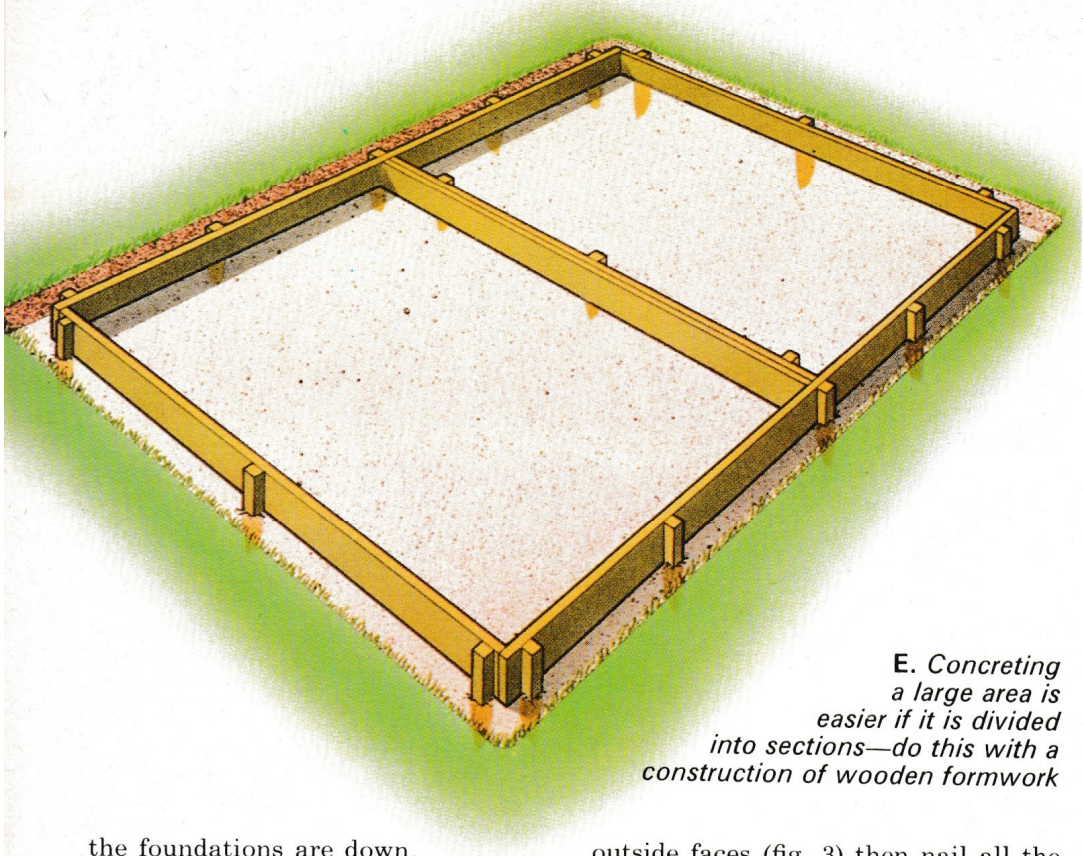
Foundations such as driveways which are going to bear the weight of a car need to be strengthened. This is done with wire mesh of about 3mm diameter which can be cut to size with bolt cutters (fig. 1).

At this stage, any obstructions on the site, such as drains, should be boxed off to prevent them being concreted over (fig. 1). Remove the box and concrete round the edges when all



D. *Check that the excavation pegs are all equal with a spirit level*

Bernard Fallon



E. *Concreting a large area is easier if it is divided into sections—do this with a construction of wooden formwork*

the foundations are down.

Lay the mesh down on lengths of timber—which are level with your setting-out lines—prior to concreting. Nail another length of timber on top of the first to hold the mesh in place while concreting the various sections (fig. 2). These lengths of timber act as the sectioning formwork necessary for concreting large areas. They should be removed after the adjacent section has been concreted.

You can then check each peg for level with a straight edge and spirit level.

Once the whole site is pegged out in this way, you can measure down the pegs to the required depth of concrete and level off the ground at this point. Keep the edges of the site sharp and in line with the setting out lines.

Constructing the formwork

The purpose of formwork (fig. E) is to stop the wet concrete from spilling haphazardly over the boundaries of the site. It can also be used to split large sites into smaller areas, which can then be concreted in stages.

Make the formwork from lengths of timber, as wide as the depth of your concrete and about 25mm thick. Place them around the boundaries of the site, butted end to end so that there are no gaps.

To hold the timber in place, drive in more wooden pegs against the outside faces (fig. 3) then nail all the pieces together.

If a large area is to be concreted or if the concrete is to run up to an existing wall, more formwork must be used to divide the site into sections of about $2m^2$. This will enable you to lay and level one section before starting on the next.

Where a path is being laid along a wall, the site should be divided into 'bays' (fig. E). Alternate bays can be filled, levelled and left to harden: you can then stand on them to fill and level the intervening bays.

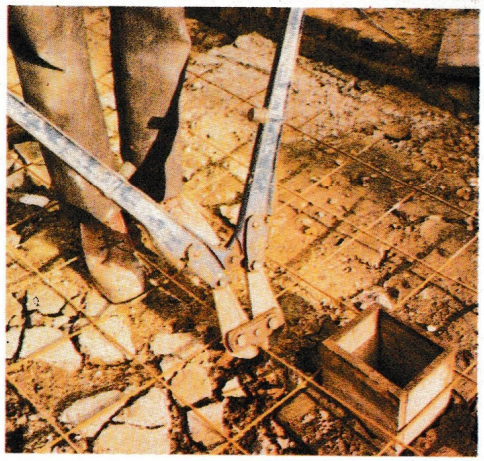
Construct the sectioning formwork in the same way as that for the boundaries of the site. Remember to drive in the support pegs on the opposite side of the sectioning formwork to that being filled.

When all the formwork is in place (fig. 4), use the straight edge and spirit level to check that the top edges of the boards are level with the tops of your marker pegs (fig. 5).

Concreting

The actual job of concreting will be much easier if you have an assistant to help you. If the concrete is being delivered ready-mixed, make sure that the formwork is ready and the ground fully levelled off.

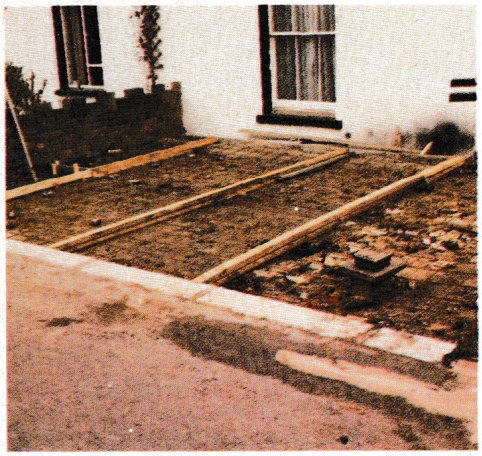
Shovel in the concrete by hand and level it off roughly 15mm above the height of the formwork (fig. 6).



1 *If necessary, the wire mesh for loadbearing foundations can be cut to size. Before concreting, box in obstructions such as drains*

2 *Lay the wire mesh on lengths of timber which have been checked for level and then another length on top to hold the mesh in place*

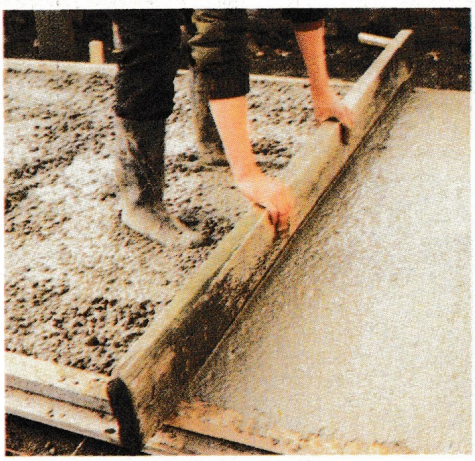
3 *Drive in wooden pegs against either side of the formwork and then nail all the pieces together to make a secure construction*



4 *All the formwork is in place—including the sectioning timber—ready for the first bay to be filled with the prepared concrete*

5 *Use a straight edge and spirit level to check that the top edges of the boards are level with the top of the marker pegs*

6 *Shovel the concrete into the first bay and level it off to about 15mm above the formwork. It can then be tamped down level*



7 *Use a heavy length of timber as a tamping beam. To be effective, the beam must be at least 150mm longer than the width of the bay*

8 *With the help of an assistant, run the beam over the freshly concreted section in a chopping motion to give a rippled effect*

When you have filled a section, the concrete must be compressed, or tamped.

The tool for doing this is called a tamping beam. You can make one from a length of 100mm x 50mm timber with wood offcut handles at either end. The tamping beam should be at least 150mm longer than the width of the section (fig. 7).

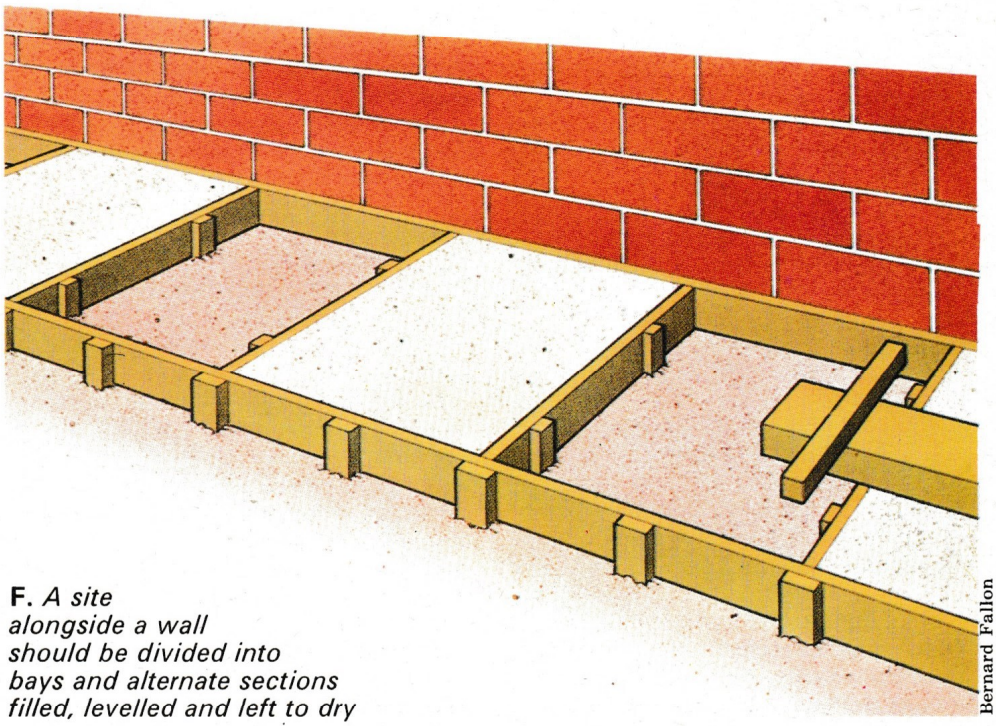
With the aid of an assistant, run the beam over the freshly concreted section in a sawing, chopping motion. The weight of the beam should be enough to tamp the concrete down to the height of the formwork, while the 'chops' will give the surface a rippled effect (fig. 8).

The distance you leave between 'chops' depends on how rippled a surface you want: the normal allowance is half the thickness of the beam.

If the tamping shows up any low spots, fill them immediately and re-tamp. When you are happy with the surface, two passes of the beam should be sufficient to complete the tamping process.

The final surface

This can be left as it is—rippled—roughened, or smoothed. For a rough surface, brush over the concrete with a stiff broom. To smooth the surface



F. *A site alongside a wall should be divided into bays and alternate sections filled, levelled and left to dry*

Bernard Fallon

9 *When one section is finished, remove the sectioning formwork between the first and the next. Then concrete this section as before*

10 *After the concrete of these alternate sections has set, remove all the formwork and fill in the last intervening bay*

11 *A steel edging trowel should be used to smooth off the edges of the concrete to give the foundation a good, smooth finish*

12 *Freshly-laid concrete needs at least a week to dry out—longer in damp weather—and heavy loads should be kept off it for ten days*

skim it over with a piece of timber or (better) a plasterer's wooden float.

Concreting subsequent sections

If you must complete the concreting in one go, carefully remove the sectioning formwork between your first section and the next (fig. 9). Place a thin, 9mm board against the next piece of sectioning formwork, check it for level then fill in the section. The 9mm board is optional, but will make it much easier to remove the next piece of sectioning formwork when the concrete is dry and give a clean, sharp edge to each section. Repeat the procedure for all subsequent sections.

If you are concreting in 'bays' fill in alternate sections with the sectioning formwork left in place. After the concrete has hardened (see below), remove the formwork and fill in the intervening sections (fig. 10).

Use a steel edging trowel to flatten down the edges of the concrete for a really neat finish (fig. 11).

Drying

The freshly-laid concrete (fig. 12) should be given at least a week to 'cure'—longer if the weather is especially cold or damp. Heavy loads should be kept off it for seven to ten days.

In warm weather, the concrete must be prevented from drying too quickly. Do this by covering the whole site with dampened sacking or a similar material. Every day, sprinkle the covering with water to keep it moist.

In cold, wet weather, the concrete will be more in danger of frost than of drying too quickly. To guard against this, cover it with sheets of heavy-duty polythene or waterproof building paper.

Laying crazy paving

Laying crazy paving provides an ideal opportunity to demonstrate your artistic abilities, to use up oddments of paving slabs and form an attractive design with random shapes.

It is a most economical way of laying a path as even the smallest oddments of paving slab can be used up. These should, however, be kept towards the centre of the path with the larger pieces around the edges, so that maximum support is given to the structure.

The foundations are laid in the same way as for all raft foundations and since these provide a good, firm base, almost any type of paving slab can be used to form the crazy, jigsaw pattern.

If the site of the path is on very firm ground and it is not likely to take any great load, the 100mm of concrete need not be laid. The paving slabs can be put straight down on the bed of lime and damp sand.

The most important part of all such foundation work is to constantly check that the site is level. Check it as you excavate the site, as you lay the hardcore and the mortar bed, and finally as you lay down the paving slabs. Careless work at this stage will ruin the finished look of the path.

To make doubly sure that the path is level across its length as well as its width, use the spirit level and board across pegs A-B as well as A-A, B-B, C-C and so on.

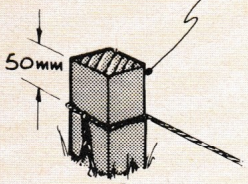
It is the most important that the path is allowed to set for a few days before any weight is put on it, otherwise the foundations may be disturbed and all your good levelling work gone to waste.

Crazy paving looks good in any garden—front or back—and can be made even more attractive by giving it curves. A curved crazy path is no more difficult to lay than a straight one. It just takes a little more patience to find the right pieces to fit the jigsaw puzzle.

Crazy paving is also one of the few external constructions which looks better as it gets older. Moss and lichen may grow between the pointing but this only makes the path look more attractive.

Bill McLaughlin

(1) Use wooden pegs 50×50×450mm and building line to set out path. Line is fixed at identical distances from top of all pegs. The line indicates top outer finished edges of path



N.B. 100mm concrete (1 cement : 5 all in ballast) should be laid over hardcore before laying lime mortar and paving. For extra strength steel reinforcing mesh will ensure stability and long life, especially if the path is to be load bearing

(2) Excavate required depth of path, approx. 250-270 mm

(3) Back fill with 100 mm well tamped hardcore, levelled with shingle or clinker

(4) Lay screed 38-50mm thick of damp sand/lime mix (8 sand - 1 lime)

(5) Using pieces of stone with straight edges set out edges tamping down each stone until level with building line.

(5A) Use a small boat level to assist accurate laying

(6) Fill with more stone using board and spirit level to maintain horizontal plane

(7) Allow to set for 2 or 3 days

(8) Point inbetween stones with 1:4 cement/sand

(9) Clean stones with dry brush before cement sets

Advertising Arts

Tongue and groove panelling

Elizabeth Whiting

For a warm cosy look in any room, natural timber is always a favourite. Tongue and groove boarding is easy to fit and durable, lending itself to many imaginative designs

Many timbers can be used for interior decoration, but the easiest to use are the tongued-and-grooved variety which have interlocking joints machined along each side. These can be obtained in a number of profiles and timber varieties, allowing you to choose the colour and texture which best suits your particular room. Planks may be between 13mm and 25mm thick, and 76mm to 152mm wide.

When planning your design, you should consider whether you want to finish the whole of a room in tongue and groove boards, or just part of it, leaving some areas in a contrasting finish. Remember too that you can choose whether the boarding will look best running vertically, horizontally or at an angle. The different preparations these require are shown on page 280.

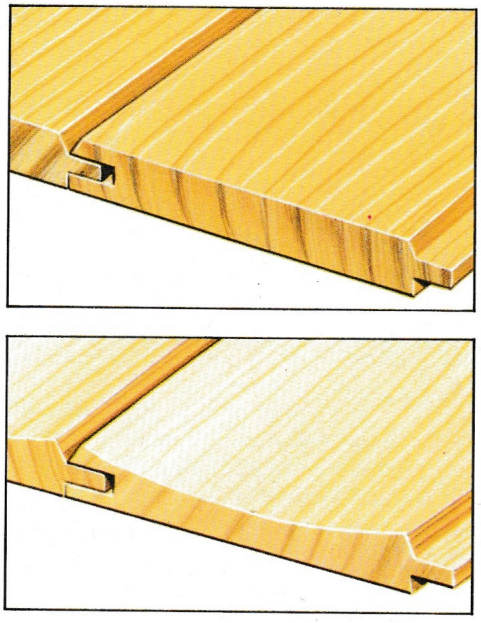
The method of fixing the timber lining depends on your type of wall. If you are fixing to a masonry wall, you must fit a support framework made of battens attached directly to the wall as shown on page 280.

Timber frame walls may also need battening unless the frame members are close enough together to make this unnecessary. Drive nails into the walls at intervals to locate the frame members.

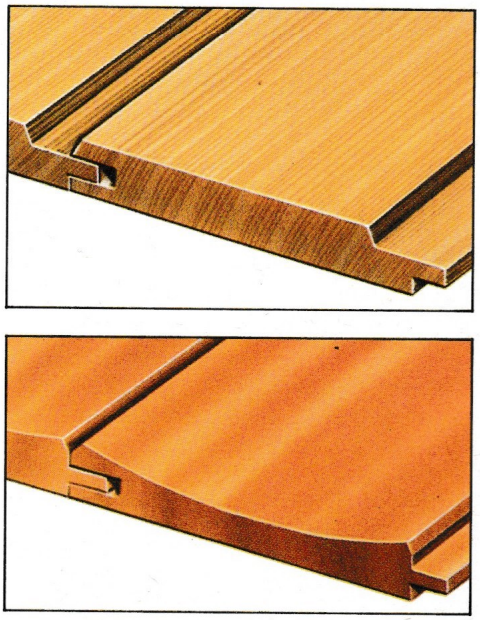
Before fixing any battens, make sure that the walls are dry. If the walls have a tendency to damp or are subject to condensation (such as a kitchen or bathroom), you can prevent this from affecting the boards by treating the walls with a special damp proofing compound for interior use. You can also use a bitumen impregnated paper, aluminium foil or 500 gauge polythene sheeting. These are fixed to the wall using neat PVA adhesive. Always store the boards for at least a week before fitting, preferably in the room which is to be panelled, to allow the timber to acclimatize.

Once this has been done and battening is completed, you can nail the boards in place as shown on the opposite page. Fitting the boards around problem areas is covered on page 281. The most important things to ensure are that boards are fitted together tightly (see opposite for cramping methods), and that you leave a gap top and bottom for movement.

Finally, give all the surfaces at least two coats of clear polyurethane lacquer to decorate and seal.



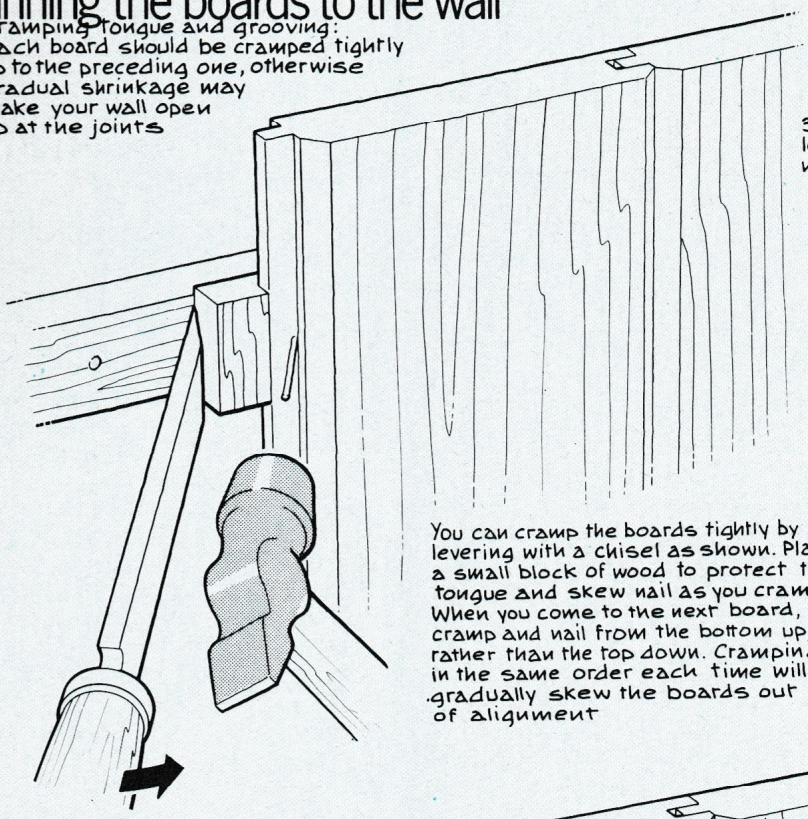
The different woods and board profiles available allow you to choose the look of your walls



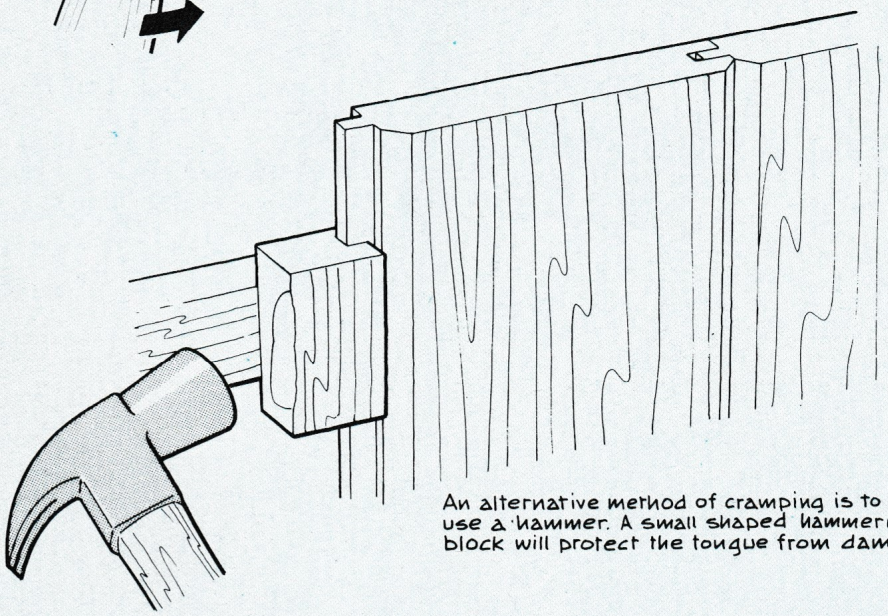
A scalloped profile may collect dust if the boards are mounted horizontally

Pinning the boards to the wall

Cramping tongue and grooving: Each board should be cramped tightly up to the preceding one, otherwise gradual shrinkage may make your wall open up at the joints

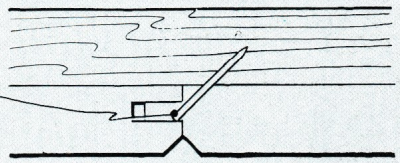


You can cramp the boards tightly by levering with a chisel as shown. Place a small block of wood to protect the tongue and skew nail as you cramp. When you come to the next board, cramp and nail from the bottom up, rather than the top down. Cramping in the same order each time will gradually skew the boards out of alignment

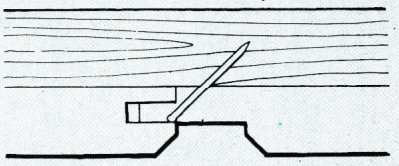


An alternative method of cramping is to use a hammer. A small shaped hammering block will protect the tongue from damage

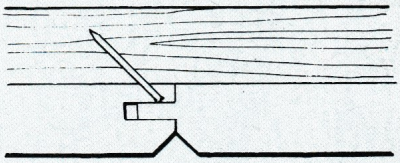
Nailing tongue and grooving



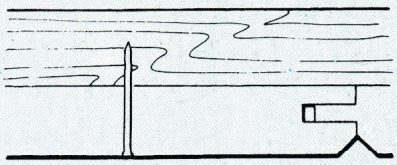
Conceal nail heads by skew nailing each board through the tongue. Nail into the battens at about 45° using a small hammer and nail punch to push the head below board surface. Then fit next board over the tongue



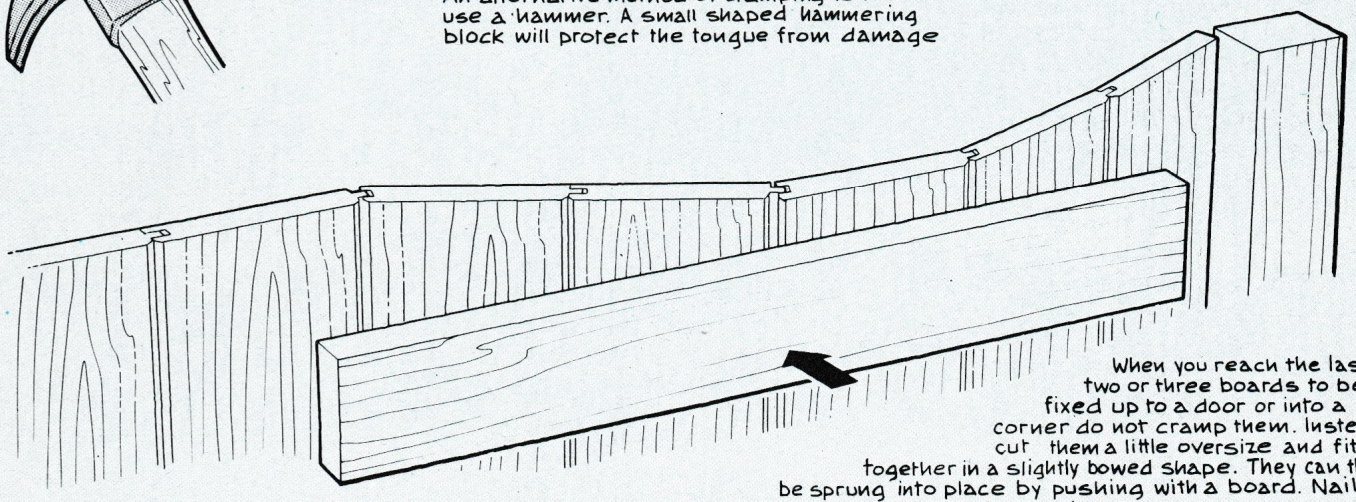
When working with open V-jointed boards, skew nail through the end of the tongue as shown or nail heads will be visible



If you have to fit boards in the reverse order, for example, into a corner, skew nail through the groove and then fit the tongue of the next board into it



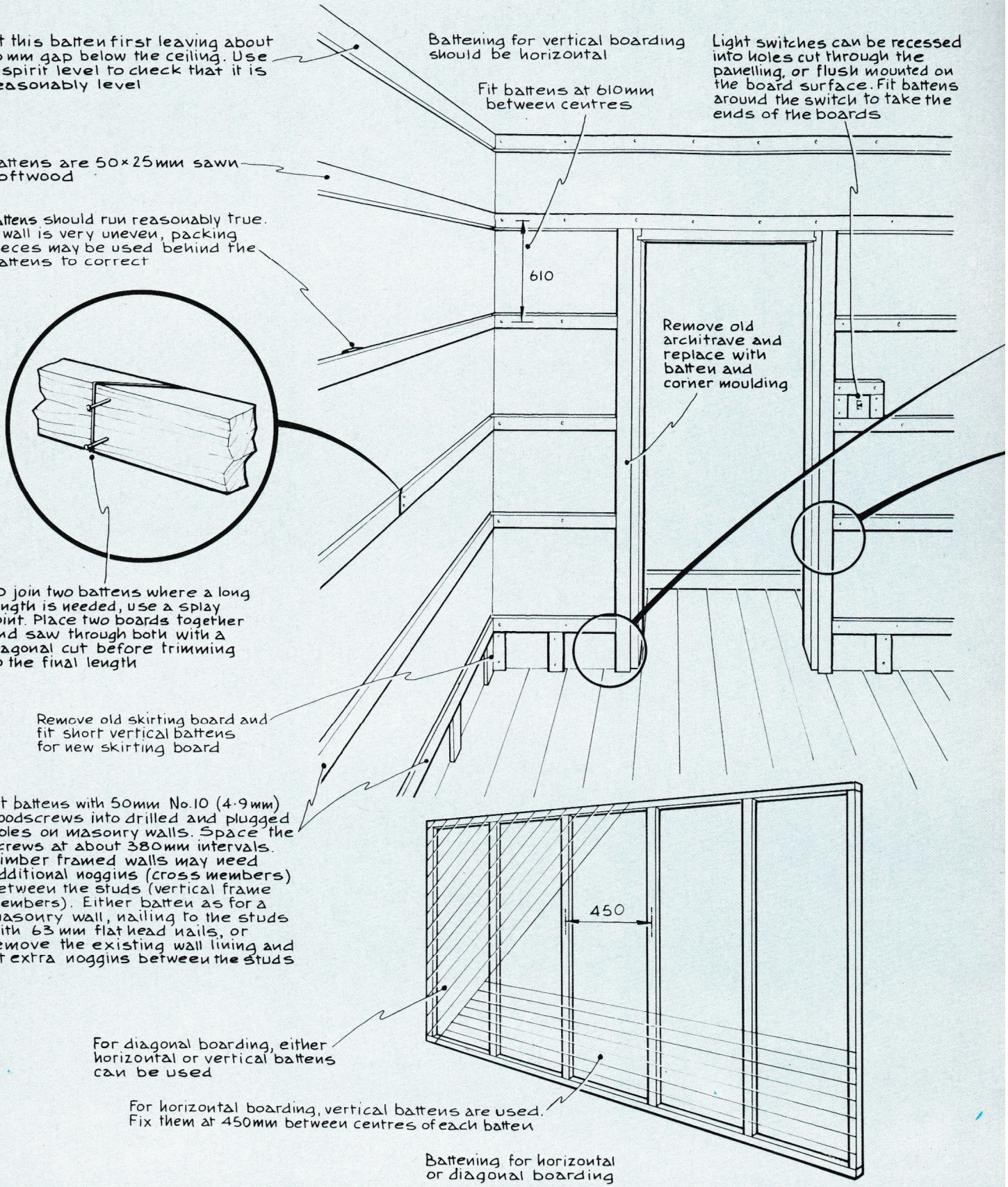
Alternatively, nail through the centre of the board, punch head below the surface and fill

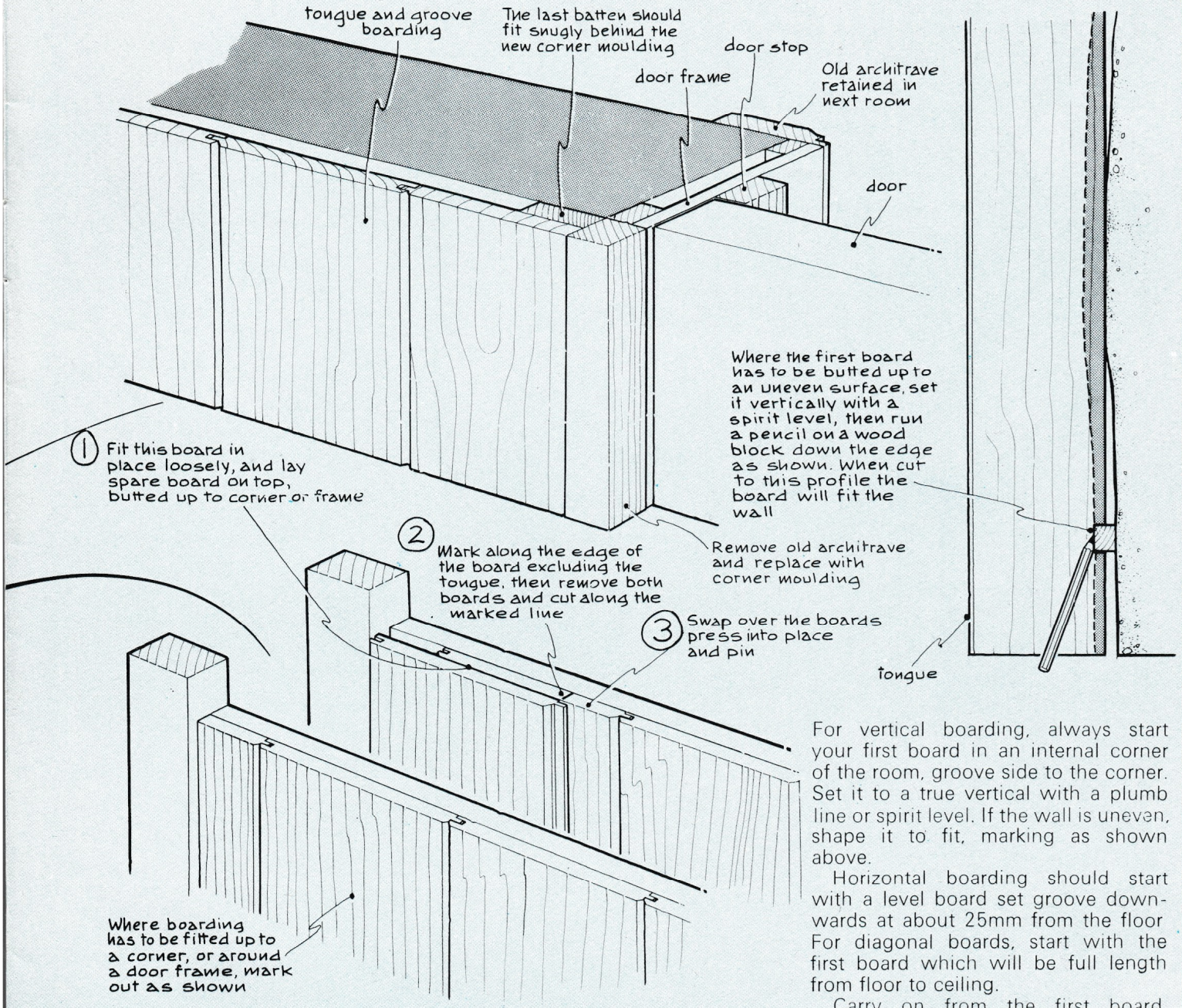


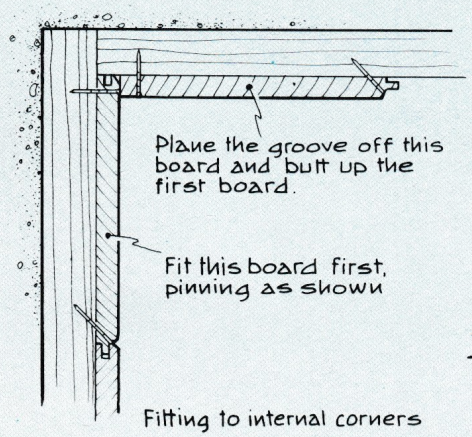
When you reach the last two or three boards to be fixed up to a door or into a corner do not cramp them. Instead cut them a little oversize and fit together in a slightly bowed shape. They can then be sprung into place by pushing with a board. Nail through the boards as shown above

Advertising Arts

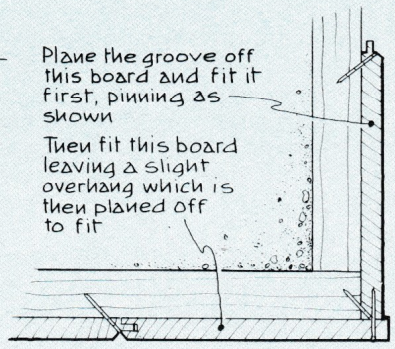
Designing the batten system


Fit this batten first leaving about 25 mm gap below the ceiling. Use a spirit level to check that it is reasonably level
Battening for vertical boarding should be horizontal
Fit battens at 610mm between centres
Light switches can be recessed into holes cut through the panelling, or flush mounted on the board surface. Fit battens around the switch to take the ends of the boards
Battens are 50×25mm sawn softwood
Battens should run reasonably true. If wall is very uneven, packing pieces may be used behind the battens to correct
610
Remove old architrave and replace with batten and corner moulding
To join two battens where a long length is needed, use a splay joint. Place two boards together and saw through both with a diagonal cut before trimming to the final length
Remove old skirting board and fit short vertical battens for new skirting board
Fit battens with 50mm No.10 (4·9mm) woodscrews into drilled and plugged holes on masonry walls. Space the screws at about 380mm intervals. Timber framed walls may need additional noggins (cross members) between the studs (vertical frame members). Either batten as for a masonry wall, nailing to the studs with 63 mm flat head nails, or remove the existing wall lining and fit extra noggins between the studs
450
For diagonal boarding, either horizontal or vertical battens can be used
For horizontal boarding, vertical battens are used. Fix them at 450mm between centres of each batten
Battening for horizontal or diagonal boarding


tongue and groove boarding
The last batten should fit snugly behind the new corner moulding
door stop
door frame
Old architrave retained in next room
door
Where the first board has to be butted up to an uneven surface, set it vertically with a spirit level, then run a pencil on a wood block down the edge as shown. When cut to this profile the board will fit the wall
1 Fit this board in place loosely, and lay spare board on top, butted up to corner or frame
2 Mark along the edge of the board excluding the tongue, then remove both boards and cut along the marked line
Remove old architrave and replace with corner moulding
3 Swap over the boards press into place and pin
tongue
Where boarding has to be fitted up to a corner, or around a door frame, mark out as shown



Fitting to internal corners


Plane the groove off this board and fit it first, pinning as shown
Then fit this board leaving a slight overhang which is then planed off to fit

Fitting to external corners

For vertical boarding, always start your first board in an internal corner of the room, groove side to the corner. Set it to a true vertical with a plumb line or spirit level. If the wall is uneven, shape it to fit, marking as shown above.

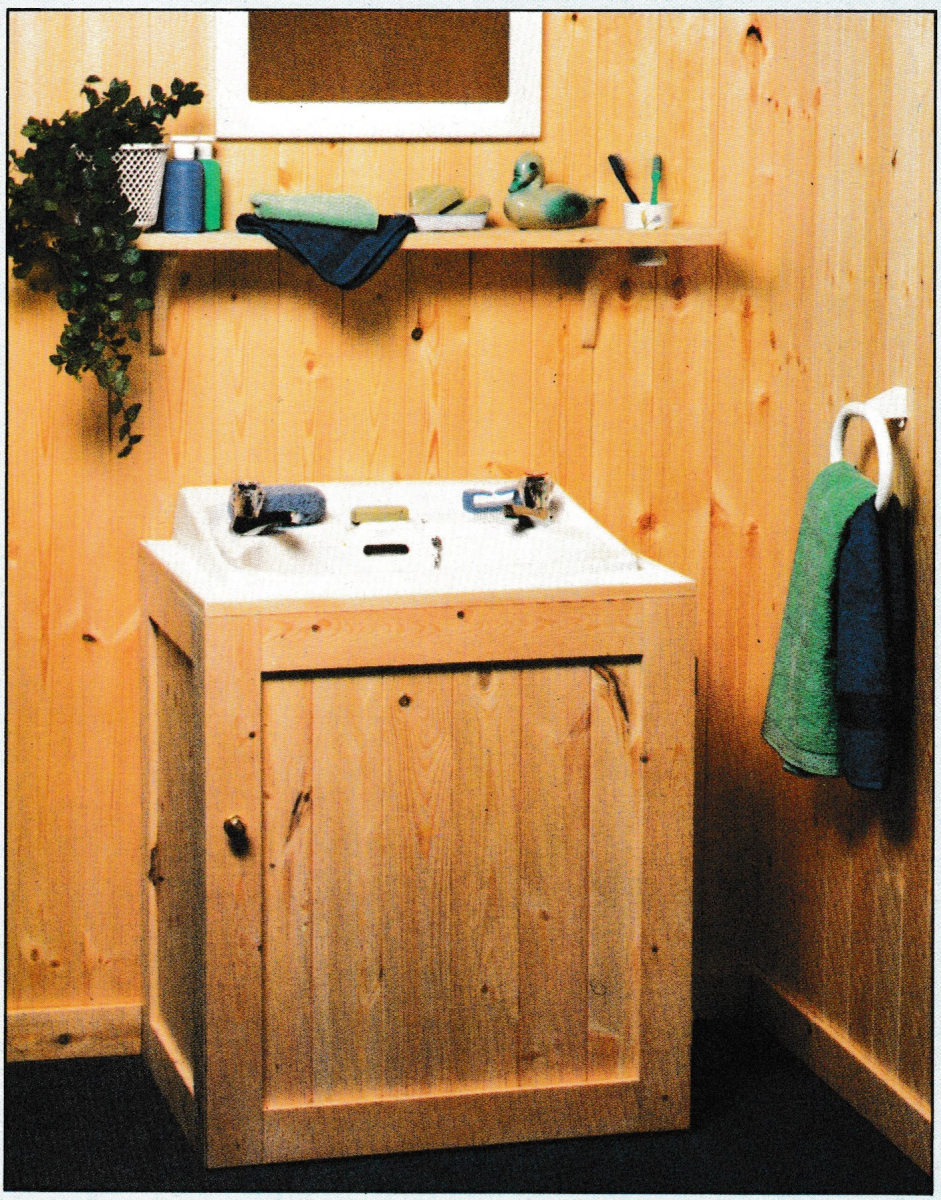
Horizontal boarding should start with a level board set groove downwards at about 25mm from the floor For diagonal boards, start with the first board which will be full length from floor to ceiling.

Carry on from the first board, cramping and nailing tightly as shown on page 279. Leave the boards about 7mm short at each end to allow for expansion and contraction.

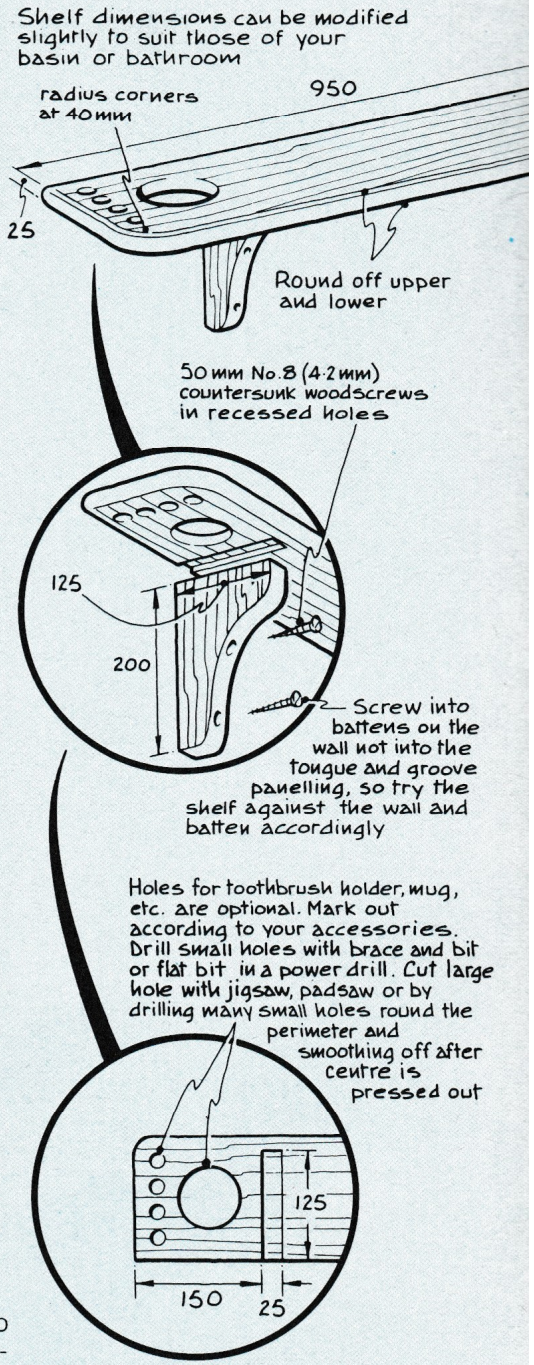
When you reach a corner, leave the last few boards un-nailed and cramp them by pressing into place as shown on page 279. The diagrams on this page show how you can fit the boards neatly around doorways and internal or external corners. When you batten, you should always provide a frame around any opening so that the cut ends of the boards are supported. A corner moulding can then be used to give a neat finish to the edge as shown in the cross section of the doorway illustrated above.

Advertising Arts

Boxing in a sink



Gavin Cochrane


Shelf dimensions can be modified slightly to suit those of your basin or bathroom
radius corners at 40mm
950
25
Round off upper and lower
50mm No.8 (4·2mm) countersunk woodscrews in recessed holes
125
200
Screw into battens on the wall not into the tongue and groove panelling, so try the shelf against the wall and batten accordingly
Holes for toothbrush holder, mug, etc. are optional. Mark out according to your accessories. Drill small holes with brace and bit or flat bit in a power drill. Cut large hole with jigsaw, padsaw or by drilling many small holes round the perimeter and smoothing off after centre is pressed out
125
150
25

This bathroom project uses tongue-and-grooved boards as a wall covering and adds a matching shelf and cabinet under the sink.

The walls can be covered using the method shown on the preceding pages. Remember when you are planning the design that the battening should be adapted to take into account the framing around the sink and the shelf supports which screw through the panels above the sink.

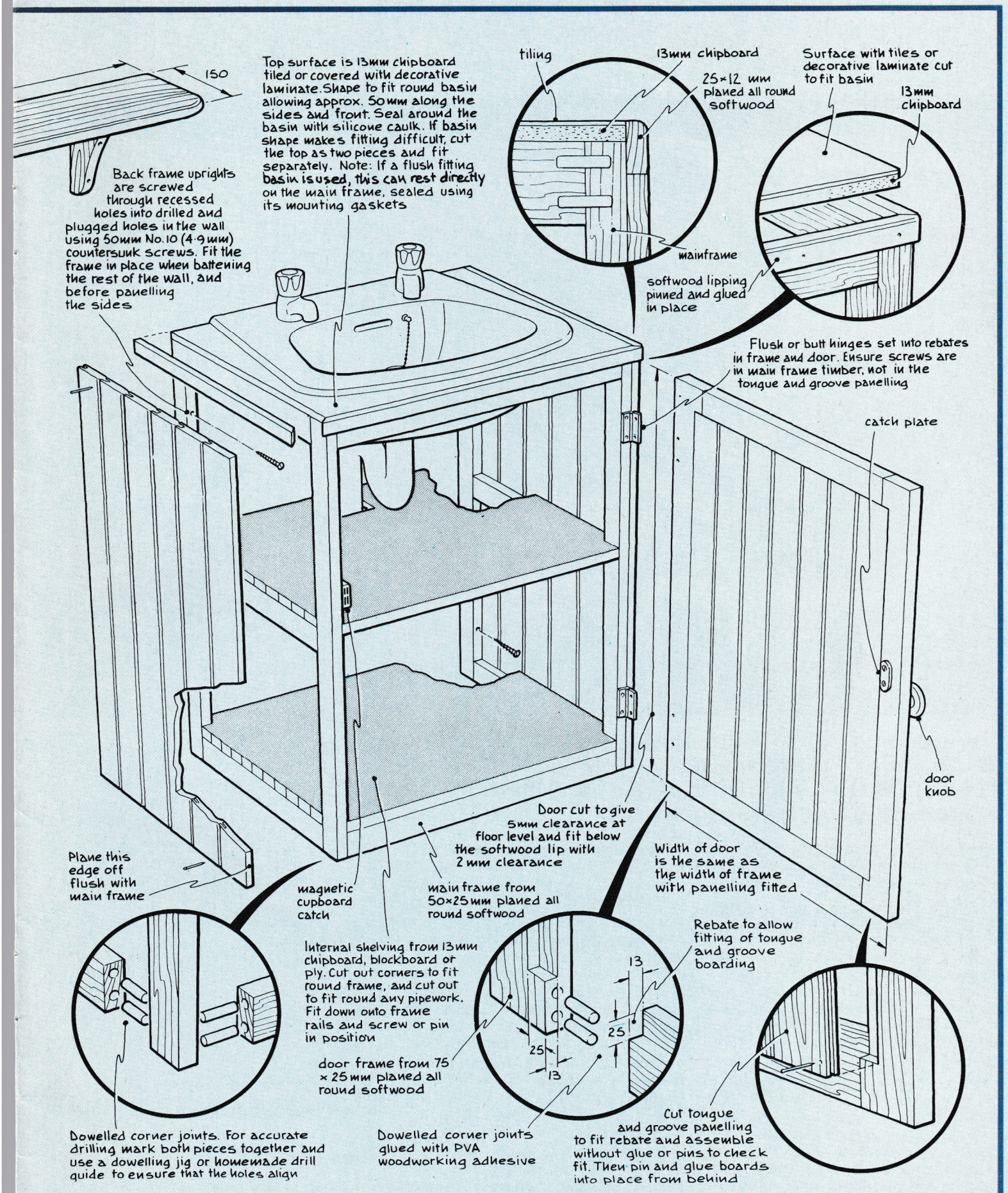
The under sink cabinet is based on a simple dowel jointed batten frame which can easily be adapted to suit any particular basin. If you are planning round an existing basin which is pedestal mounted, you will have to allow internal clearance for the pedestal. If you are fitting a new basin, it is easiest to use a flush mounted model supported by the frame and recessed.

The basic designs are easy to adapt to other applications. For example, you can panel in the bath or exposed pipework in the same way. Note that you should leave a removable panel to allow access to the pipework.

Finally, make sure that you use timber which is suitable for the damp, warm atmosphere of a bathroom and that it is thoroughly sealed all round with a clear waterproofing agent such as polyurethane lacquer.

Note: The dimensions of individual sinks vary, so it is not possible to give exact measurements for height, depth and width. Width is optional, but do not make the cabinet much deeper than the sink as this will make access difficult. The height of the main frame is dependent on that of the basin. Allow about 18mm for the thickness of the top (chipboard and tile) and make a further allowance for this to be set below the top surface of the basin

Finish: The atmosphere in bathrooms tends to be very moist, so it is important that the wood is well protected. Use two coats of cellulose sanding sealer then two coats of melamine or polyurethane clear lacquer both inside and out


150
Back frame uprights are screwed through recessed holes into drilled and plugged holes in the wall using 50mm No.10 (4·9 mm) countersunk screws. Fit the frame in place when battening the rest of the wall, and before panelling the sides
Top surface is 13mm chipboard tiled or covered with decorative laminate. Shape to fit round basin allowing approx. 50mm along the sides and front. Seal around the basin with silicone caulk. If basin shape makes fitting difficult, cut the top as two pieces and fit separately. Note: If a flush fitting basin is used, this can rest directly on the main frame, sealed using its mounting gaskets
tiling
13mm chipboard
25×12 mm planed all round softwood
mainframe
softwood lipping pinned and glued in place
Surface with tiles or decorative laminate cut to fit basin
13mm chipboard
Flush or butt hinges set into rebates in frame and door. Ensure screws are in main frame timber, not in the tongue and groove panelling
catch plate
door knob
Door cut to give 5mm clearance at floor level and fit below the softwood lip with 2 mm clearance
Width of door is the same as the width of frame with panelling fitted
Plane this edge off flush with main frame
magnetic cupboard catch
main frame from 50×25 mm planed all round softwood
Internal shelving from 13mm chipboard, blockboard or ply. Cut out corners to fit round frame, and cut out to fit round any pipework. Fit down onto frame rails and screw or pin in position
Rebate to allow fitting of tongue and groove boarding
13
25
25
13
door frame from 75 × 25 mm planed all round softwood
Dowelled corner joints. For accurate drilling mark both pieces together and use a dowelling jig or homemade drill guide to ensure that the holes align
Dowelled corner joints glued with PVA woodworking adhesive
Cut tongue and groove panelling to fit rebate and assemble without glue or pins to check fit. Then pin and glue boards into place from behind

Advertising Arts

Maintaining central heating

Left: *All the radiators in a central heating system should be bled of air once or twice a year. If there is a substantial air lock in a radiator, it will prevent it from functioning normally*

Operating your system for maximum efficiency ● Regular maintenance ● Troubleshooting checks ● Dealing with noise ● Draining the system ● Clearing airlocks

When a central heating system ceases to function properly, it becomes an expensive liability. But it does not always take an expert to repair it. Many common faults can be cured just as easily by the householder.

The most complicated part of the average domestic central heating system is the boiler. This may well require specialist knowledge and tools to put it right should it fail—but failures in boilers which are regularly serviced are rare. More prone to trouble are circulation pumps, thermostats and radiators which only have a limited life.

Faults here are usually easy to identify and even if a specialist has to be called in, being able to pinpoint a problem will help keep repair bills to a minimum.

Wet central heating systems

In order to identify a particular fault in a central heating system, it is worth having some idea of how the system works. The theory of both indirect and direct wet central heating systems is described on pages 26-29.

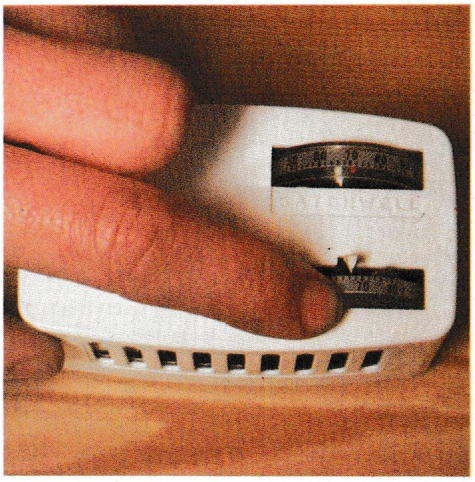
In most modern systems, hot water flows from the boiler to the radiators and hot water cylinder, releases its heat and returns to be reheated. The flow is created artificially by an electric circulation pump which is normally mounted adjacent to the boiler. The pump is controlled by a time clock and, in most cases, by a room thermostat as well.

At pre-selected times, the mechanism in the clock switches on the pump. The pump then sends hot water to the radiators, heating the house.

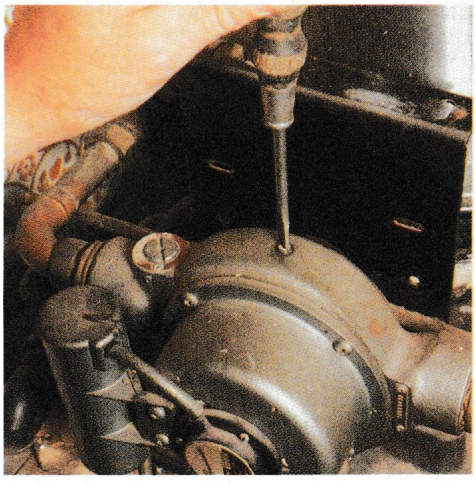
Maintenance of the system

Although all central heating systems should be serviced at least once a year by qualified engineers, you can keep the system running reliably by correct use and regular maintenance.

It is not advisable to switch off heating at night during cold weather. A small amount of heat—to ensure that the temperature throughout the



1 *To check a room thermostat, turn it to its lowest setting. Turn it back up again, listening for a click as the pump is switched on*



5 *To free an air lock in the pump, unscrew the vent valve located at the top. When water begins to trickle out, close the valve*

house never falls below 10°C (50°F)—cuts the time needed to reach full operating temperature and will, in the long run, save fuel. It will also help to reduce condensation and prevent frost damage to the system.

The boiler should never be run at too low a thermostat setting. There is no economic advantage to be gained and it can shorten the life of the boiler. The boiler thermostat in a conventional small bore system should be set at up to 82°C (180°F) in winter. In summer, when the system is required for hot water only, it should be kept at not less than 54°C (130°F).

If the system is oil-fired, the oil tank should be examined annually. Any external rust should be removed with a wire brush and glasspaper and then painted over with black bitumen paint. Keep the vent pipe on top of the tank clear, removing any obstruction with a stiff piece of wire. A piece of fine wire mesh can be fitted over the end of the vent pipe to ensure that leaves do not enter the tank and restrict the flow of fuel to the boiler.

To clean the oil filter on an oil tank, turn off the stop cock and remove the filter bowl. Clean the element with paraffin, dry it and refit. At the same time check the oil line from the tank to the boiler for leaks, tightening joints where necessary.

When a solid fuel boiler is not in use it should be left clean. Remove sooty deposits from the combustion chamber and flue and leave the damper and boiler doors open to allow a current of air to pass through. Have the flue cleaned at least once a year.

If a central heating system has to be left drained for any length of time and stop valves are fitted on either side of the circulation pump, you can close the valves, remove the pump and dry it thoroughly to prevent rusting.

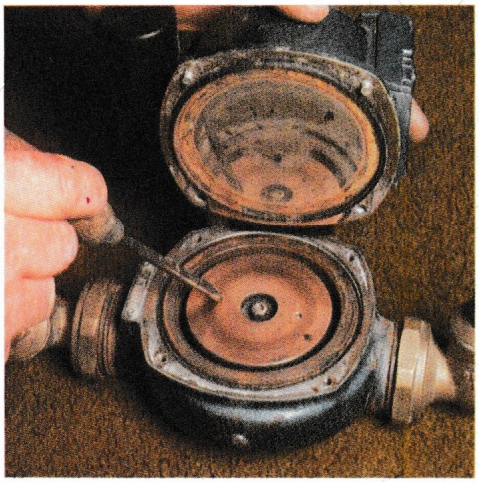
Once or twice a year, the circulation pump valves and all the radiator valves should be turned as far as they will go in both directions and then back to their original setting. This will prevent them becoming fixed.

Overheating

Overheating is one of the most common faults found in wet central heating systems. In all cases of overheating, if the fault cannot be rectified at once, the supply of gas or oil to the boiler should be cut off as a precaution. If you can run the circulation pump with the boiler off, keep it circulating water so that the heat is dissipated through the radiators. With

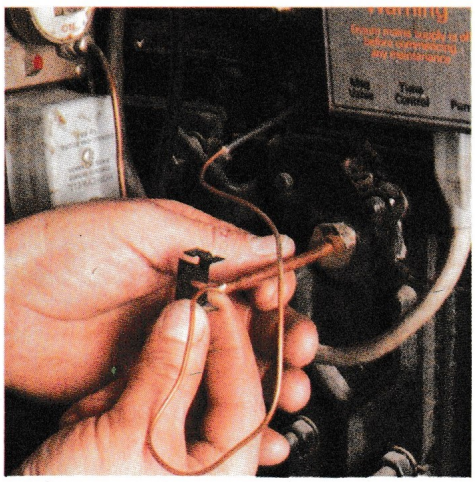
2 *To find out whether a circulation pump is working, hold one end of a screwdriver against the casing with the handle to your ear*

3 *On pumps with all-metal casings, you may have to drain the system and remove the unit before you can unscrew the casing*



4 *If the rotor has seized, you may be able to free it by inserting a screwdriver into one of the slots and levering gently*

6 *To check the boiler thermostat, turn the dial down and then back to its maximum setting. If there is no click, the thermostat is jammed*



7 *If the sender bulb on the end of the copper capillary has come out of place, reposition it and replace its securing clip*

8 *Make sure that the level of water in the expansion tank is not more than 150mm from the valve outlet. If it is, add more water*

a solid fuel boiler, rake the fire into the ashpan and remove it.

If the house feels abnormally hot, check the time clock and, if there is one, the room thermostat. These may be failing to turn the pump off when they should or have had their settings accidentally advanced. Start by turning the time clock down to the present setting. If the radiators do not cool down at the time they are supposed to, the mechanism of the clock has probably jammed and will have to be replaced with a new one.

To check a room thermostat, turn it down to its lowest setting and then back up again. A click should be heard as the switch inside turns the pump on. If there is no click, the unit will have to be replaced.

If the whole system is overheating seriously, the radiator pipes may make prolonged knocking or hissing noises and there will be excessive temperature in the boiler delivery pipe. One possible reason for this is failure of the circulation pump.

To find out whether the pump is working, hold one end of a screwdriver against the casing with the other end to your ear and listen for the hum of the rotor inside (fig. 2): if there is no noise, this is probably stuck. On pumps with a screw-on glass inspection cover, the rotor can be freed quite easily. Turn the pump off, unscrew the cover and insert a screwdriver into one of the slots in the rotor. If the rotor does not spin freely, it should be possible to free it by levering gently with the screwdriver (fig. 4).

On pumps which have all metal casings, the water supply must be cut off before opening the cover. In most cases, there are stop valves on each side for this purpose but where no such valves are fitted, the system will have to be drained before carrying out any work on the pump.

If the pump is heard to be working but water is evidently not circulating, there is probably an air lock. At the top of the pump you will find a vent valve—operated either by a key or a screwdriver—from which the pump can be bled (fig. 5).

To do this, turn the pump off and leave it for a few hours to allow the water in the system to settle. Then open the valve to bleed the air off. A hiss of air will be followed by a trickle of water: when the trickle becomes constant, close the valve.

If the fault is not in the pump, the boiler thermostat may have failed. The thermostat, a small box with a dial on the top, is located behind the boiler casing. Remove the casing and check that the electrical connections on the thermostat are sound. Check also that the sender bulb on the end of the copper capillary from the thermostat to the boiler has not fallen out of its socket (fig. 7). If so reposition it and replace the securing clip.

Note the setting on the boiler thermostat dial and turn it down low. After a few minutes turn it back towards its maximum setting and listen for a click. If there is no click, it may mean that the thermostat has jammed and you should call in a qualified engineer to check it.

If the boiler thermostat appears to be working, check to see whether the boiler flue outlet outside has become blocked in some way. Depending on the nature of the blockage, expert help may be needed in order to clear it.

If the flue is free of any obstruction, the next thing to check is the expansion tank. The ball valve supplying it may have become jammed or seized, in which case there may not be enough water in the system to absorb the heating action of the boiler. If the level in the tank is more than 150mm from the valve outlet, free the valve and introduce more water into the system. Where the valve is completely seized, replace it with a new ballcock, arm and piston unit.

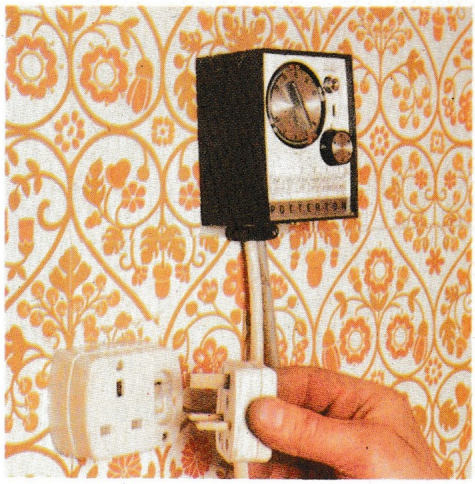
Central heating too cool

If all the radiators are cool and the boiler is working correctly, the fault probably lies with one of the thermostats, the time clock or the circulation pump. Carry out checks outlined above under 'Overheating', paying special attention to the position of a room thermostat if fitted. This reacts to the temperature around it, and a nearby heat source can cause it to give a false reading even though the mechanism may be perfectly sound.

To work efficiently, the thermostat should be mounted on an internal wall at least 1.5m above the floor and away from draughts, radiators and direct sunlight. It should not be placed in rooms which are in constant use—such as lounges—because people generate extra heat, nor in kitchens, because of the heat from cooking and appliances. However, it should be accessible so that changes in setting can be made conveniently.

Draining the system

Before doing any major repairs or modifications to your central heating, you will have to drain, or partially drain the system. Start by turning the boiler off and leaving the system for a few hours to cool down. Turn off the electricity supply to the time clock and the immersion heater—if the system includes one (fig. 9).

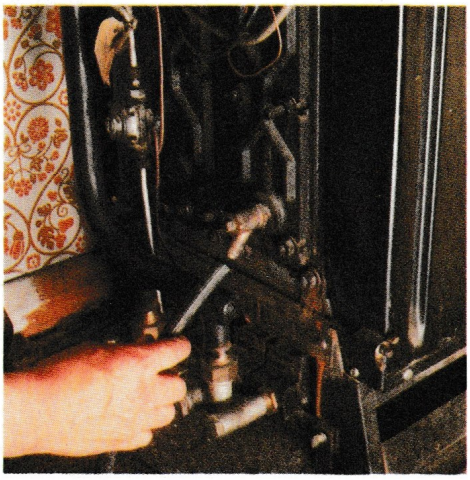


9 *Before draining a central heating system, turn off the electricity supply to the time clock and also to the immersion heater, if fitted*

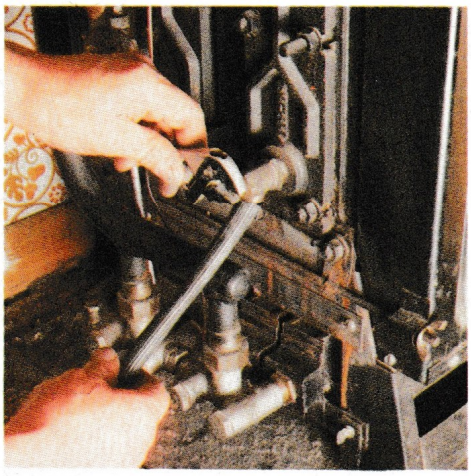
10 *To shut off the water supply to the boiler, close the stop valve tap on the pipe which leads into the expansion tank*

Shut off the water supply to the boiler by closing the stop valve on the pipe into the expansion tank (fig. 10). If no stop valve is fitted, lash the ball valve in the expansion tank to a piece of wood laid across the tank.

When the system has cooled, return to the boiler and identify the main drain cock. This is usually at the front end of the boiler near the pump where it is always built into the lowest pipe. Alternatively, it may be found on a ground floor radiator. Attach one end of a garden hose to the nozzle and run the other to an outside drain. Open the drain cock by turning the nut beneath with a spanner or adjustable wrench and allow as much water as you require to drain away (fig. 12).



11 *When the system has cooled down, attach one end of a garden hose to the nozzle of the main drain cock on the boiler*



12 *Run the other end of the hose to an outside drain, then open the drain cock by turning the nut beneath with an adjustable wrench*

Refilling the system

Before refilling, close the main drain cock securely. Open the valve on the pipe leading to the expansion tank, or untie the ball valve, to admit fresh water into the system. Regulate the position of the valve so that the tank fills slowly—keeping the risk of air locks to a minimum. Also check the drain cock for leaks.

Noise

Noise is another common problem with wet central heating systems. Creaking under the floorboards and around radiators is caused by pipes—which expand and contract according to the temperature of the water—rubbing against the floor joists on which they rest. Creaking can also occur where a pipe rises through the floorboards to feed a radiator.

The creaking can often be reduced by turning the boiler thermostat down so that the radiators remain switched on for longer periods instead of constantly heating up and cooling down.

If the noise persists, take up the floorboards around the suspect area. Eventually you will find a point where one or two pipes cross a joist and are notched into the woodwork. If the notch is so small that it causes the pipes to rub against each other, enlarge it to give a better clearance. Make sure, though, that the notch does not exceed one sixth of the depth of the joist or it will seriously weaken the timber. Use a piece of rubber pipe lagging, felt or carpet, trimmed to the approximate size of the notch, to cushion the pipes (fig. 13).

Where a pipe rises through a gap in a floorboard, either enlarge the gap by filing it away or pack the space around the pipe with padding (fig. 14). Metal pipe brackets—another common source of noise—can be bent back slightly, and stuffed with felt to prevent them making direct contact with the pipes (fig. 15).

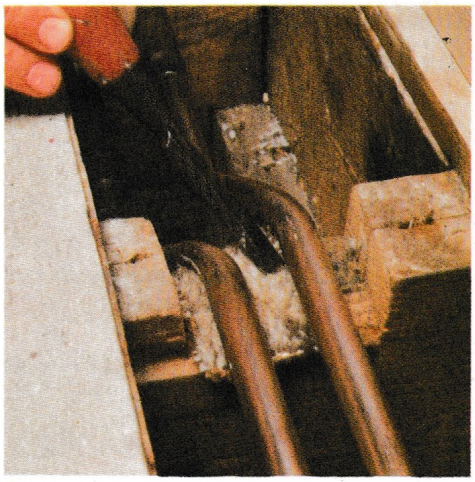
Creaking behind radiators is usually caused by the hooks on the back of the panels rubbing against their corresponding wall brackets. For serious cases, on smaller radiators, special nylon brackets can be fitted in place of the normal pressed steel type. A simpler solution is to place pieces of felt or butyl (rubber) between each hook and bracket. This can be done, with the help of an assistant, by gently lifting the radiator away from its brackets, slipping the pieces of felt into the hooks and then replacing it.

Immersion heaters

In many systems, hot water for sinks and baths is heated by a thermostatically controlled immersion heater in addition to the boiler-fed heat exchanger (see pages 26-29). The thermostat is pre-set to turn the heating element off when the water reaches the selected temperature. If the water is unbearably hot, the thermostat may simply need adjusting.

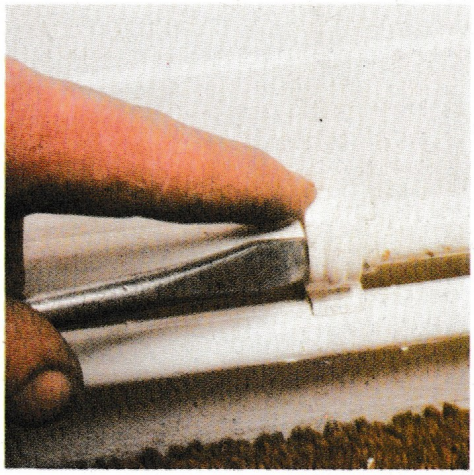
The thermostat control is found at the top or on the side of the hot water cylinder (fig. 16). To adjust it, turn off the electricity supply to the heater then unscrew the element cover where you will find a small dial marked centigrade, fahrenheit, or both. By hand, or with a screwdriver, turn the regulator screw to the desired temperature—normally 60°C (140°F) in hard water areas or 80°C (180°F) in those with especially soft water.

If the water heats up slowly, or the

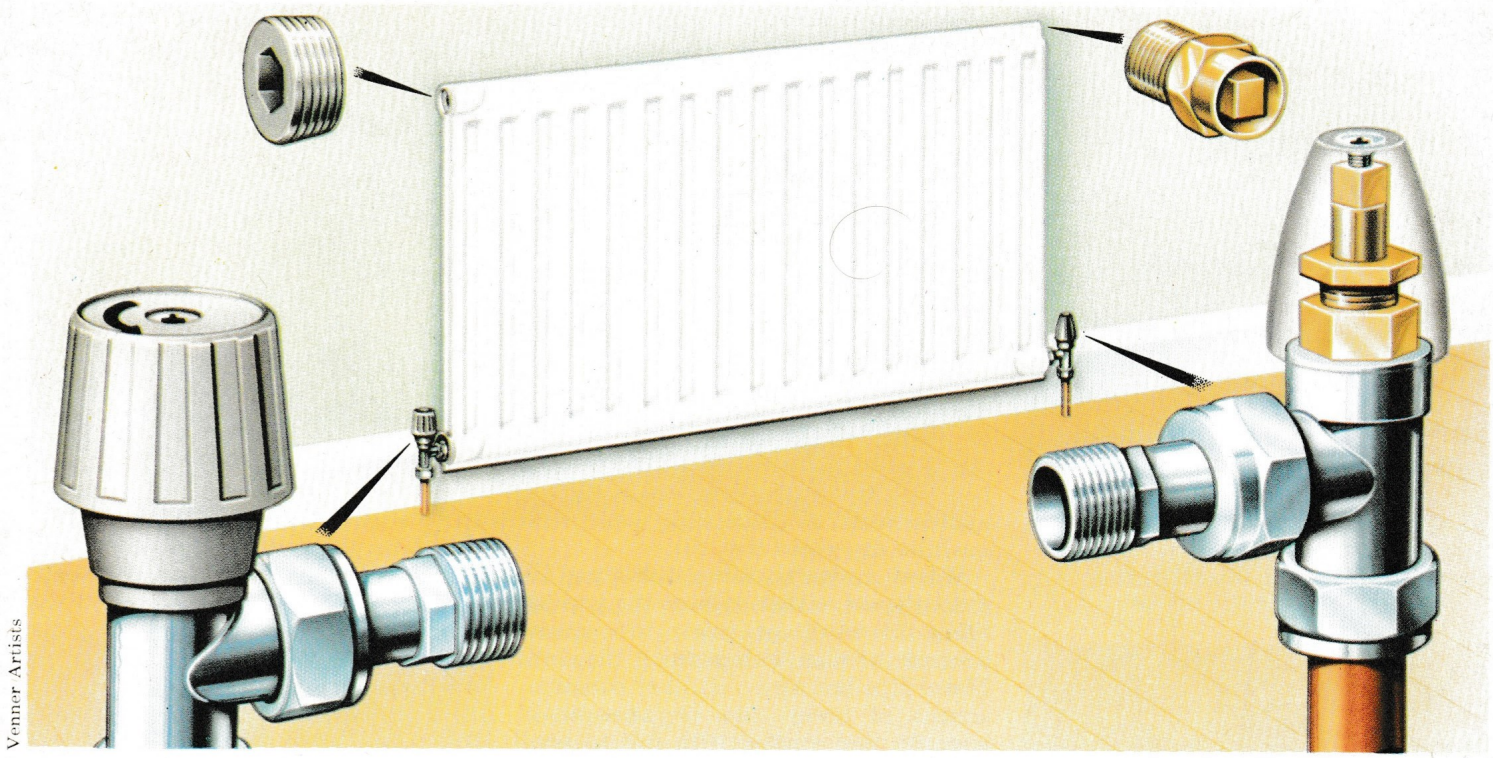


13 *Pipes often creak where they run through a notch in a floor joist. Cushion the pipes with felt or carpet to stop the noise*

14 *A pipe may rub against wood where it rises through the floor. Pack the gap round the pipe with pieces of suitable padding*



15 *Metal pipe brackets are another common source of noise. Bend them back slightly and stuff pieces of felt into the gaps*



Venner Artists

hot tap cools too quickly, check that the cylinder is sufficiently lagged and that the lagging is in good condition. If it is, try adjusting the thermostat. When water fails to heat up at all, either the thermostat control or the heating element are defective and will have to be replaced.

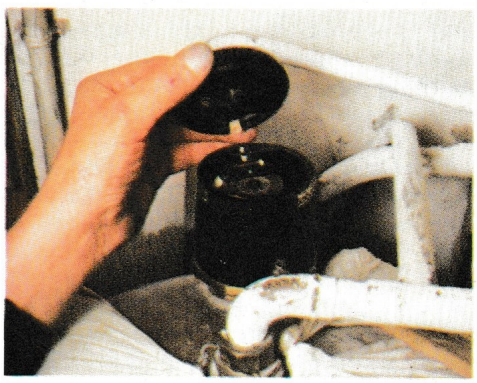
Radiator controls

Most radiators are fitted with two valves—a *handwheel* and a *lockshield* valve. The handwheel allows radiators to be shut down individually or the temperature of a radiator to be reduced by restricting the flow of water. The lockshield valve is set when the system is installed, to give a balanced flow of water through the radiator.

There is no basic difference between the two valves except that the lockshield valve is locked into position to prevent casual adjustment. A lockshield valve should normally need adjusting only when a radiator has to be removed for decoration or repair. When this is necessary, both the lockshield valve and the handwheel should be closed. To close a lockshield valve, unscrew the cover and turn the valve with a spanner or a wrench.

In some cases, thermostatic radiator valves are fitted in place of handwheels. A radiator thermostat can be pre-set to maintain any desired temperature and is controlled by temperature sensitive bellows. As the water temperature falls, the bellows contract to allow more hot water into the radiator. Radiator thermostats are usually only suitable for use in a two-pipe system (see pages 26-29).

16 *To adjust the thermostat control of an immersion heater, unscrew the element cover on the top or side of the cylinder*



17 *Remove the cover to locate the temperature dial. Turn the dial by hand or with a screwdriver to the desired temperature mark*

Above: *Most radiators are fitted with two valves, called a handwheel and a lockshield valve, which control the flow of water. The vent valve at the top is opened to release air*

Bleeding a radiator

When air accidentally enters a wet central heating system, it can find its way to a radiator and prevent this from functioning efficiently. All radiators should be bled of air once or twice a year to clear the small amounts that inevitably get into the system. But if a radiator becomes cold whilst others are functioning normally, the cause is probably a substantial air lock and the radiator should be bled immediately. The top of a radiator remaining cold while the bottom is scalding also suggests an air lock.

On most radiators a square ended hollow key—obtainable from ironmongers—is needed to open the air vent valve at the top. To prevent air being sucked into the system, turn down the room thermostat and switch off the time clock so that the pump stops working.

Place a towel underneath the radiator to catch any drips, then open the valve by turning the key anticlockwise until a hiss of escaping air is heard. As soon as water begins to flow, re-tighten the valve.

If air locks occur frequently in a certain radiator, you can fit a screw bleed valve or an automatic air eliminator. These save you from constantly having to bleed it by hand.

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Where to buy it—UK

Using plants Pages 261-265
Storage bins for planter from: Crayonne at branches of Habitat
All about hinges Pages 266-271
All hinges shown from: Woodfit Ltd., Whittle Low Mill, Chorley, Lancs. PR6 7HB
Tongue and groove panelling Pages 278-283
'Aquaseal' damp proofing compound from: BP Aquaseal Ltd., Keysnorth, Rochester, Kent ME3 9ND
'Sisalkraft' bitumen-impregnated paper from: British Sisalkraft, Knight Rd., Strood, Rochester, Kent ME2 2AW
Tongue and groove boarding from selected timber merchants

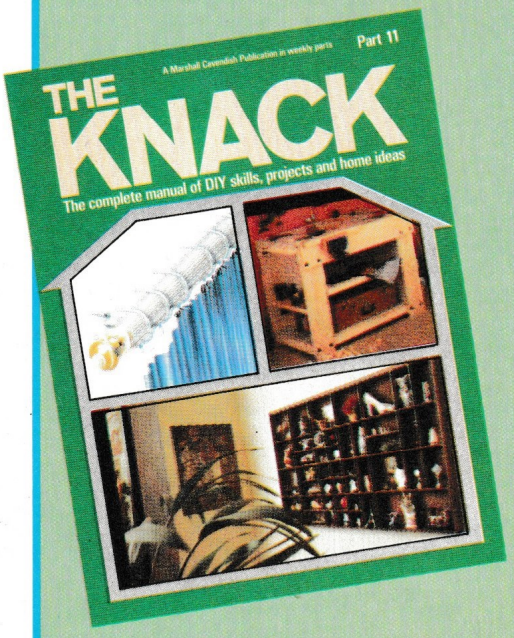
Where to buy it—Australia

All about hinges Pages 266-271
Most of the hinges shown are available from neighbourhood hardware stores and large department stores throughout Australia. Try also cabinet makers in the Yellow Pages.
Tongue and groove panelling Pages 278-283
The Australian equivalent of Aquaseal damp proofing compound is called Aquatite Hydro Epoxy compound and is made by Pabco. Available from hardware stores.

Acknowledgements

Pages 266-271 Woodfit Ltd., Whittle Low Mill, Chorley, Lancs.
Page 282 Hand basin, taps, etc. from: Gosletts, Shepherd's Bush, London W12
Bathroom accessories from: John Lewis, Oxford St., London W1

In next week's issue


A Marshall Cavendish Publication in weekly parts
Part 11
THE KNACK
The complete manual of DIY skills, projects and home ideas

All about wall ornaments: Pictures, lights, wall hangings, paper, fabric—the choice of wall ornaments is vast. Home designer helps point you in the right direction and gives some useful hints on how to get the best results

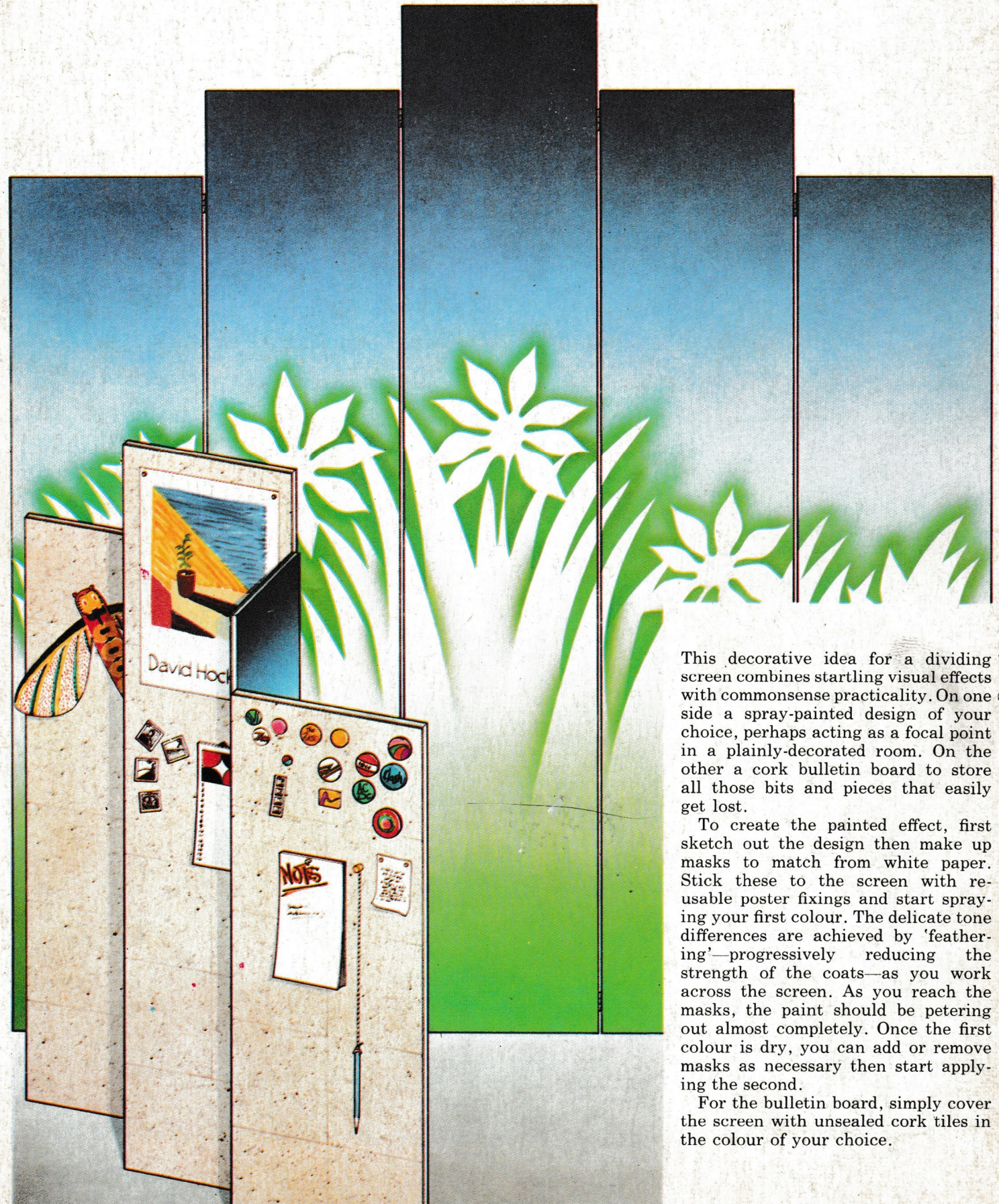
Dealing with damp: If it isn't spotted quickly, damp can cost you a fortune in structural repairs. We show the tell-tale signs to watch out for and describe the remedies.

A handyman's bench: A boon to any home carpenter, the work bench featured in our main project is designed to be versatile and long-lasting. As well as plans for the basic version, we show how you can go on adding to the bench as and when you can afford.

Above-ground drainage: A common trouble spot in the home, we show how the system works and describe the sort of things that can go wrong with it. Also included are details of how to plan a drainage extension.

Hanging curtains: There's a lot more to this job than you might think. Part 6 of the decorating course takes you through it in detail and gives plans for an easy-to-make pelmet.

Decorate your screen



Bernard Fallon

This decorative idea for a dividing screen combines startling visual effects with commonsense practicality. On one side a spray-painted design of your choice, perhaps acting as a focal point in a plainly-decorated room. On the other a cork bulletin board to store all those bits and pieces that easily get lost.

To create the painted effect, first sketch out the design then make up masks to match from white paper. Stick these to the screen with re-usable poster fixings and start spraying your first colour. The delicate tone differences are achieved by 'feathering'—progressively reducing the strength of the coats—as you work across the screen. As you reach the masks, the paint should be petering out almost completely. Once the first colour is dry, you can add or remove masks as necessary then start applying the second.

For the bulletin board, simply cover the screen with unsealed cork tiles in the colour of your choice.